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1921



SCOTT'S FIELD SEEDS



*Selected and Cleaned to be
Free from Weed Seeds, Dead
and Immature Grains.*

O.M. SCOTT & SONS CO
MARYSVILLE, OHIO.

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FOREWORD



SO MANY absorbing facts are to be related about Field Seeds and so much knowledge and warning about weeds is necessary that we try to compile a Seed Book that will hold attention by the valuable information it contains.

We like to think that every farmer, whether our customer or not, will come to depend upon Scott's Field Seed Book constantly for reference.

To induce you to read it clear through we beg to quote a few of the expressions of satisfaction and praise which came to us voluntarily after Scott's Field Seed Book went out last year.

"It is the most instructive literature I have ever read on the subject. A friend begged me to give the book to him, but I shall not part with it. He is a large and wealthy farmer, so please send him a copy."

"It contains so much information, presented in such a pleasing manner, that we laid aside other interesting matter to finish it. It goes into our library of farm information and will, no doubt, be consulted for years to come."

"We received your book and have no hesitancy in saying that it is the most complete and comprehensive work of the kind that we have ever seen."

"I wish to thank you for your little book on seeds—I mean little in size—it's worth a dozen of the ordinary kind of seed catalogues."

If Scott's Field Seed Book seems to you to contain good advice in the selection of Seed and the avoidance of Weeds, will you not further its mission by passing this copy on to another farmer? We will gladly send you one to replace it.



Success in agriculture is dependent upon ability to co-operate with the soil. If the ground is to produce profitable crops, the farmer must keep the soil supplied with elements that are essential to plant life, and effectively combat weeds.

Being Seedsmen, we are more concerned with the second consideration; although both our booklet "Friendly Workers of the Soil," and another section of this Seed Book, are devoted to the subject of soil fertility.

In the matter of weeds prevention is far better than cure. The medical profession today is directing its best thought to the **cause** of disease. The farmer should correspondingly regard the cause of the weed.

The buyer of seed loses twice if he buys carelessly. He not only pays Seed prices for Weeds, but he plants them. The loss doubles again, for he has wasted the ground, and is put to the added expense of digging up the weeds. In the section of this Seed Book entitled "How to Know Good Seed," we give explicit instructions for the selection of seed. The test is a simple one. It is a sure one. We rely upon our seed to stand it.

No matter how markets may vary from one year to another, it is excellent economy to sow pure Seed. A year ago all Seed was very high, and price was apt to seem the most important consideration. At the lower prices now prevailing quality should regain its proper place in the mind of the planter. There is always sufficient **reason** for sowing the best Seed. There is never an **excuse** for sowing anything else.

The farmer is beset by Seed "bargains." Price is shouted in large type. These offerings are usually in the nature of mixed Seed in which Weeds are not easily seen. Among Experiment Station experts mixed Seed is in bad repute.



Experiment Stations will test without charge. Yet comparatively few take advantage of this service. The many who buy on the spur of the moment and without such tests need especially to be able to judge Seed accurately themselves.

No matter what Seed you have used we invite closest comparison.

Doing One Thing Well

WE are exclusively in the Field Seed business. From the outset we have concentrated our efforts upon the single purpose of furnishing to our customers the purest Field Seeds obtainable.

We have seen many seedsmen carried away by the vision of unusual profits in garden and flower seeds, fall short of their possibilities for Field Seed service.

Our greatest pride is in the fact that some of the most discriminating Seed purchasers in the land are our customers year after year, and there are numbered among them many well-known men.

The growth of this business has been satisfactory, but not phenomenal. We know we have selected the only way in which it can be built soundly and the only way in which every gain can be a source of gratification to us. Every year we supply a greater number of experiment stations, and every season more county agents recommend Scott's Field Seeds.

By virtue of our determination to do one thing and do it well we believe we have a 100 per cent chance of getting the next order after Scott's Seed is once given a trial. With such an assurance it is possible to handle Seed on a very narrow margin of profit.



Weeds

SINCE the beginning of time Weeds have hindered legitimate plants, occupying their space and stealing their sustenance. Not only are they parasites, but the definite enemies of all useful plants. They take everything and give nothing. Wherever Weeds unmolested mingle with other plants it is the Weeds that thrive and survive.

The annual loss to this country from Weeds is incalculable. The railroads of Ohio alone spend half a million dollars a year in the effort to suppress them. The State of Iowa estimates its yearly loss from Weeds to be five to six million dollars.

The presence of Weeds aside from their indication of poor farming, means a loss in the following ways:

They rob crops of moisture and valuable soil elements.

They crowd plants out of space and light.

They may harbor plant diseases.

They may be poisonous to men and animals.

They may prevent the drying of hay or grain in the shock.

They constitute an adulterant in harvested products.

The twining kinds often interfere with harvesting.

They add expense to the harvest and loss to the grain.

They may interfere with the system of crop rotation.

The only service Weeds can be said to render is in saving the careless farmer from soil erosion and adding humus. For this they require a terrible price.



Field Seeds Less Weeds.

To effectively fight so powerful an enemy the farmer must be certain of—

Clean cultivation.

Short rotation.

Immediate eradication of new kinds as they appear.

Watchfulness against introductions in Seed.

The most practical, efficient and economical method of prevention of new Weeds is **Extreme Care in Seed Buying.**

Sowing impure Seed is giving aid and comfort to the enemy. The Weed Seeds will be as evenly distributed as the Good Seeds and will contend for every square foot of the ground.

Besides Weeds impure Seed contains a large amount of blasted grains. These make weak plants, easily crowded out by the Weeds. If Seed from such planting were used again the quality would further deteriorate, and eventually as crop succeeded crop the Weeds would gain complete control. Large plump grains make strong plants that are capable of taking care of themselves.

The largest and most profitable crops are always raised by the farmer who exercises the greatest care in the selection of his seed.

The following statement is from a Maryland Bulletin:—

“The question of pure seed is a very important one in weed control. There is scarcely any agricultural question of more vital importance than the question of good seed; none in which slighter differences can have greater influence on the result; none in which there is greater opportunity for fraud.

“Nearly all our bad weeds have been introduced in seeds of various crops, especially in grass and clover



seed. Weeds are being carried every year to new localities in this way. One must be constantly on the lookout, and no seed should be sown without a careful examination for weed seeds.

“Every farmer wants to be sure whether the seed he is planting is the variety or strain he wants and whether it has sufficient vigor to make healthy plants, that is, whether it will germinate properly and whether it carries any infectious disease. He also wishes to know whether it is adulterated with weeds or other plants not desired.”

On every hand it is plainly to be seen that the question of sowing pure seed is paramount. The farmer who is not alive to the necessity of fighting weeds, is committing agricultural suicide.

The whole situation has been sized up by the U. S. Department of Agriculture in the following statement:

“In a sense, farming might be called a warfare against weeds. Some farmers emerge from the struggle victorious, while others go down to defeat. So powerful are weed enemies in reducing crop yields, while at the same time multiplying labor, that the farmer should at every turn strengthen his position against them. He should bear these invaders in mind in planning crops he will grow and in deciding on the fields where he will grow these crops, in choosing the implements he will use, IN BUYING HIS SEED—far more important than to kill weeds is to avoid having weeds to kill.”

The best seed is the first essential of economical production and with the best no time is lost in seeding, no labor wasted in weeding and a maximum crop is realized.

Weedless seeds conserve energy. Weedy seeds waste it. Weedless seeds assure a profit, while weedy seeds make a loss certain.



Field Seeds Less Weeds.

Scott's Seeds

A DESIRE to furnish pure seeds must be accompanied with knowledge as to how that sort of seed can be obtained and properly handled.

It is a fact not well known that a very few small sections of this country produce Red Clover seed free from Buckhorn, one of the worst weeds we know. One section that has supplied us with considerable seed free from buckhorn is now overrun with Dodder, a world-wide pest. A county long famous for pure Red Clover has succumbed to various clover diseases. One fine producing section has no seed this year on account of unfavorable weather.

Some territory particularly favorable for Alsike seed is infested with Canada Thistle, probably the meanest weed that grows.

The widespread production of Alfalfa seed indicates that it should easily be found free from all weeds, but much western territory has Dodder, Russian Thistle and other weeds.

So it goes through the whole list of field seeds. Buckhorn, Dodder, Dock and other weed seeds cannot be entirely removed from Red, Mammoth, Alfalfa and Sweet Clover, even after the most painstaking cleaning. Canada Thistle, Dodder, Sorrel and Buckhorn will still be in Timothy and Alsike, if they grow with the crop. Bluegrass, Redtop and Orchard Grass are so light that few weeds can be taken out.

So we have always maintained that seed must be carefully selected as well as thoroughly cleaned if freedom from weeds is a consideration.

We regard the map of the United States as a Seed map, the complexion of which is constantly changing. It is not often that the same place will have a good crop two successive years. Half of a county may raise the highest grade of seed this year, and the crop of the other half may be worthless. Next year and possibly



for several years to come that county may produce no seed at all.

We cannot guarantee Field Seeds to grow. Too many things can happen after the seed is planted. But we are always anxious and willing to make right anything that goes wrong through our fault. We only wish that our customers would let us know when something occurs that is not entirely satisfactory.

We desire to keep service on the same plane with Scott's Seeds. We want to serve if for no other reason than that it pays. We want to make it easy for you to send your orders to us.

You want Seed that will go far, that will add to production and produce a crop that is practically free from Weeds. It would be unduly modest not to assert that we are supplying that kind of Seed. Samples submitted to test will prove it to your satisfaction.

This cannot be said of all Seed. In fact, a very small proportion of the seed grown in this country can be rated as being practically free from Weed Seeds and dead grains. Pure Seed is not any higher in price than the ordinary run. The several pounds of undesirable matter that is usually left in must be considered. Such impurities often left in, boost the price of the actual Good Seed to an unreasonable figure, even if the original price is low.

Careful buying of Field Seed means weighing price against quality and seeking the best source of supply. Admittedly pure Seed is desirable Seed. Where to get it and at a fair price are important things to know. Price is not all, for price without quality is waste and folly. Pure Seed can be had and pays returns all out of proportion to the care expended to secure it. Careless buying exacts a toll in depreciated crop that many times offsets any initial saving.

We deal in Field Seeds only, so that if there is any advantage in buying or selling we should have it, as so much of our attention is devoted to growing and harvesting conditions and the study of the markets, to crop



Field Seeds Less Weeds.

yields and production prospects both in this country and Europe. All these things have a decided bearing on prices. We are enabled to buy at the most favorable time, and the advantage is passed on to our customers.

We want your conclusion to be that Scott's Seeds are handled intelligently, that they pass through a certain process before being distributed, that they are economical to sow and that you take no risk whatever in sending us your order.

"Scott's Seeds are always so reliable, germinate so well and are so free from weed seeds that I would not think of sowing any other kind."

W. H. ROSS,
The Ross Health Resort, Brentwood, L. I., New York.

"I know you will be careful about the seed. I talked to quite a number of people who have used Scott's Seeds, and they all speak very highly of them."

C. A. SMITH,
East Liverpool, Ohio.

How to Know Good Seed

WHEN your field shows bare spots.

When the weeds are about as plentiful as the sowed crop.

When plants are small and weakly.

Then you may know that you have sowed the wrong seed.

Perhaps you bought mixed seed or seed at a bargain price or you may have paid the highest price without taking the trouble to have an analysis made. In any case we recommend that you use our test in making your next purchase.

It does make a difference what seed you buy.

Such an imitation of good Seed cannot fool you if you use our test.

You fail to get the best results from your labor if you carefully work the ground and then make a mistake in buying Seed.

A Bulletin issued by the Canada Experiment Station contains the following: "Too much care cannot be taken to procure clean seeds. An additional cost of 50 cents per acre for seed known to be clean is cheap in-



surance against losses caused by the introduction of noxious weeds. Commercial seed should be carefully examined and the kinds and nature of any weed seeds included therein clearly understood before they are sown. Many seed samples that appear to be clean contain seeds of the most objectionable weeds."

In selling Seeds we have found that the lack of ability to judge Seed is accountable for many more failures to secure good quality than actual indifference.

The following test is very simple, but it is at the same time unfailing. We recommend it as the only way to estimate the worth of Seed yourself.

TEST

Take a level teaspoonful of the seed you want to test and spread it out on a piece of white paper. Scrape to one side all the waste matter such as dead grains, weed seeds and chaff. Compare the two piles.

One you can profitably pay for—the other means a loss, for which you pay the good seed rate.

This operation puts before the sower a simple basis of comparison between the worth of our Seeds and the worth of other Field Seeds.

Consider that in buying a bushel of seed you get six thousand times the amount of waste matter found in a teaspoonful. Just three weed seeds in a teaspoonful means that one will be sowed on every square yard of ground when you sow at the usual rate.

To find the exact amount of pure seed, have a druggist weigh the pile of seed and then the pile of waste matter. Divide the small amount by the total weight and the result will show the percentage of impurities in the sample.

You may be surprised to know how much worthless waste you have been buying along with your Field Seeds. **And remember, Weeds mean a loss even if you get them for nothing.**



Field Seeds Less Weeds.

HARD GRAINS

All clover seed contains a certain percentage of hard seeds that are slow in absorbing water. This percentage is largely dependent on weather conditions at maturing time. Last season's clover seed contained much more hard seed than usual, a germination of 80 per cent being considered very good. In normal times the germination of 85 per cent is about an average. In making tests clover seed is left in the germinator five or six days. Of course, some of the hard grains will germinate if not removed for several days longer and many of them, undoubtedly most of them, will grow when planted in the ground and subjected to moisture, heat and the chemical action of the soil. While it hardly seems possible, it is a fact that seeds having the finest appearance (and containing the largest amount of plant food to give the young plants a good start) are those that ordinarily contain the greatest number of hard grains. In buying seed it should be borne in mind that freedom from weed seeds is of greater importance than germination, providing, of course, that this is not unusually low and that seed germinating 10 per cent more than another lot, may be inferior on account of immature grains that will make weak plants.

GERMINATION

To make a germination test, remix the seed and count out, say, 200 seeds. Be sure to take them just as they come and do not choose the best grains for the object is to find out what percentage of the total seed will grow. The seed may be planted in a box of dirt or sand kept moist, or may be put between two blotters or strips of cotton flannel, placed on a plate covered with another plate upside down. This prevents evaporation. Keep the blotters moist but not in water and as near the temperature of 70 degrees as possible. Examine the seeds each day and see how they are germinating. Weak or slow germination indicates that the seed will make



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weak plants. Sprouted seeds may be removed each day if desired. Some seeds require a longer time to germinate than others.

The proper germination periods are as follows:

Clover seed between three and six days.

Timothy and Red Top between five and eight days.

Orchard Grass between six and fourteen days.

Kentucky Bluegrass fourteen to twenty days.

By estimating the percentage of pure seed (the exact percentage can be found only by using weights), and multiplying this percentage by the percentage that germinates, marking in decimals and dividing the market price by this result you get the approximate cost of one bushel of absolutely pure seed, every grain of which will germinate.

Seed costing \$10 per bushel with a purity test of 99½ per cent and a germination test of 94 per cent costs \$10.69 per bushel for perfect seed.

Seed costing \$10 per bushel with a purity test of 99½ per cent and a germination test of 80 per cent on account of dead grains shows an actual cost of \$12.56 per bushel.

Seed costing \$10 per bushel with a purity test of 98 per cent caused by weed seeds and other waste matter and a germination test of 80 per cent shows an actual cost of \$12.75 per bushel. This third lot is about the same as lot two in actual value of perfect seed, but is worth many dollars per bushel less on account of weed seeds.

If you want to go into the matter of seed testing a little more thoroughly, send for Farmers' Bulletin No. 428, from which much valuable information can be obtained.

The accepted system of making purity tests seems to be the only practical one, but a person not familiar with it is quite likely to be deceived. You would naturally suppose that 99 per cent pure meant that 99 per cent of the seed would be good, plump, healthy grains.



Field Seeds Less Weeds.

But this is not the case, as is shown in the following letter. We asked about clover seed; the same test is used on other seeds.

Department of Agriculture

Washington, D. C.

O. M. Scott & Sons Co.,

Marysville, O.

Gentlemen:—Replying to your inquiry of August 15, I would say that it is the practice of this laboratory to consider all clover seed as pure seeds in clover seed tests whether they are shriveled or not and all parts of seeds larger than one-half as pure seeds. Broken pieces smaller than one-half are considered as inert matter. This is also the practice recommended by the Association of Official Seed Analysts of North America.

Yours very truly,

E. BROWN,

Botanist in Charge.

In making a purity test seed analysts classify impurities as follows:

Inert matter, including broken seeds, dirt, stone, sticks, chaff, and other similar materials.

Foreign seed, including all seeds except those of the kind being examined.

We call particular attention to the fact that no mention is made of dead grains, not even those that are so badly shriveled that any one can tell there is no life in them. It is left to the germination test to show the actual value of the seeds.

Seed may contain 25 per cent or even more of these worthless grains and still test 99 per cent pure.

Above all things, test the seed yourself or have it tested. Do not rely upon a claimed purity test alone, but use our test in judging the amount of dead grains the sample contains.

Remember, however, that blasted grains are not of as much importance in the long run as weed seeds. The



very brightest and plumpest seed testing 99½ per cent pure may contain enough weed seeds of a noxious variety to cause one to be sowed on each square foot of the field.

The Farmers' Bulletin last quoted (No. 428) says: "The fact that seed of the principal forage crops in which both the purity and the viability closely approach 100 per cent does appear on the market justifies one in assuming that all seed of these crops sold as high-grade should possess equally good quality."

This is the sort of seed that we are trying to furnish. By testing samples as suggested in the foregoing, you can judge for yourself how we are succeeding.

Not all seed can be sold on a "tell you how to test it" basis. Our seeds are sold in no other way, for we know that the more you know about field seeds, the more anxious you will be to sow Scott's Seeds.

One wants to be careful in buying seed this year for a lot of Italian seed is being imported, which is not hardy, is subject to diseases and makes a smaller growth than the native seed. Then, too, you know with seed so high a few pounds of dead grains or waste matter left in a bushel of seed makes an immense difference in value.

"Please send quotations on seeds as published from time to time. Many farmers in this vicinity are ordering and I am always glad to quote your prices, as I know your seeds have no superior."

LESLIE J. MERRIAM,
County Agent, Sutton, W. Va.

"One of my neighbors has been looking at the seed I recently got of you. He is altogether well pleased with its appearance and wanted me to order some for him."

D. P. QUINN,
Sherodsville, Ohio.

"I have good success with your seeds. Will certainly say a good word for you to all the farmers around."

RALPH E. DUDLEY,
Douglas, Mass.

"Very kind of you to rush my seed. Received and fine quality."
J. W. NICODEMUS,
Extension Service, Ohio State University.



Field Seeds Less Weeds.

Alfalfa

THE MOST important forage crop in the world." It is well known that Alfalfa is the cause of the Kansas farmers' prosperity. It is no less true that it can be profitably raised in nearly all sections of the United States. It has been a valuable forage for centuries. The Roman agricultural writer, Columella, who lived in the first century, in speaking of different kinds of fodder, said:

"The best is herba (our Alfalfa), because when it is once sown, it lasts ten years; because it can be mowed regularly four times a year, sometimes even six times; because it fertilizes the land; because all emaciated stock fatten on it; because it is a remedy for sick cattle; because a jugerum (about three-fifths of an acre) suffices for three horses for a whole year."

The plant has been improved by breeding and selection until it is even more valuable today. As the price is now low, it should be sowed in large quantities. Two or three pounds per acre added to the regular mixture improves the quality of the hay and at the same time helps inoculate the ground that is later to be sowed to Alfalfa alone.

The 1919 crop of Alfalfa was far below the average in quality and quantity. Indeed, it was difficult to procure any seed that was free from weeds. But from the 1920 crop we have plenty of American grown Alfalfa seed that is practically pure. The country is full of European seed, most of which is imported from Turkestan. It produces less hay than the native grown and usually contains buckhorn, dodder and other weeds. The commercial value of foreign seed is two or three dollars less per bushel than American grown. Alfalfa seed offered at less than the average price is quite likely to be the imported article.

Weeds

SOME SEEDSMEN do not count freedom from weed seeds as of as much importance as locality where grown, but it is a fact accepted by all Experiment Stations that weeds are the thing to consider when sowing Alfalfa. The seed bed should be clean and the seed itself free from weed seeds. If weeds are abundant, the young Alfalfa plants will be smothered out. To get a good stand of Alfalfa, two things are obviously necessary: land free from weed seeds, and Alfalfa seed free from weed seeds. The first year weeds are Alfalfa's worst enemy. Aggressive weeds can ruin a good stand.

In sowing alfalfa it is a question not so much of pounds per acre as of quality of seed and proper soil conditions. Seven pounds



of seed that is pure and of strong vitality is better than fifteen pounds that contain weed seed.

The expense of preparing land is the same no matter what kind of seed is sown. The actual difference in the cost per acre between the best and the poorest seed is very little, but the cost of care and of harvesting is greatly increased if weedy seed is sown. It is most unwise to sow weeds with one hand and fight them with the other. Trouble, annoyance and loss are saved by testing seeds. You can not afford to omit investigating the seed you expect to sow.

That the danger of impurities is a real one is proved by analyses of more than 500 samples of alfalfa seed made by the New York Experiment Station. Of 548 samples almost one-fourth contained seeds of dodder, while still larger percentages of the samples showed seeds of buckhorn, yellow foxtail and green foxtail. Considerable percentages contained wild carrot, and Russian thistle, and occasional samples were contaminated with seed of curled dock, crab grass, Canada thistle, chicory, charlock, black mustard and quack grass.

Locality Where Grown

In many cases the importance of locality is exaggerated in order to obtain an extra price for seed which, not infrequently, is unfit to sow.

It has been asserted by growers in South Dakota and Montana that alfalfa from seed grown in those states would more surely withstand winter-killing than from seed grown in Kansas. As this belief has been generally accepted, seed from the northernmost states has commanded an extra price of two or three dollars per bushel. We have not found this preference justified. Careful experiments by many authorities working independently and at Experiment Stations have shown no difference in hardiness.

Mr. L. F. Graber, Secretary of the Alfalfa Order of Wisconsin, and connected with the Wisconsin Experiment Station, says: "The matter of hardiness in alfalfa is not so much a proposition of where the seed is grown or how old the field is; it is more particularly a matter of the strain or variety of alfalfa."

From the standpoint of purity and economy everything is in favor of Kansas seed, as alfalfa reaches the highest point of development in that State. Alfalfa from Kansas seed will recover more quickly after being cut and will have a larger yield than seed produced further north. We suggest that you consult your Experiment Station before paying an extra price for a well-advertised seed that may be full of weeds.

For the reason that Kansas furnishes ideal conditions for the growth of alfalfa and the development of the seed, it is always possible to get seed in that State that is absolutely free from weeds. In no other State is seed produced that is as pure. In South



Field Seeds Less Weeds.

Dakota growing conditions are not so favorable for seed development and full stands and as a result seed from this section nearly always contains objectionable weed seeds, which can not be removed.

In the first part of this book we have demonstrated many of the losses due to weeds and have shown that inferior seeds thoughtlessly sown may mean the spreading of weeds all over your own and neighboring farms. One of the leading authorities has the following to say on this subject: "Had a few Dakota farmers been alive to the danger when the first Russian thistles appeared in their flax fields, the spread of that most pernicious plant might have been prevented to the great advantage of large areas of the country."

In Montana and Idaho, however, in practically the same latitude as South Dakota we are able to get alfalfa seed that is free from weed seeds, and we always have this to offer as well as Kansas seed.

Especially in Idaho we can find seed of excellent quality.

In sections where winter-killing occurs and selection for hardiness seems necessary, we advise that by all means Grimm Alfalfa should be used rather than seed at a fancy price of doubtful origin and uncertain worth.

Food Value

Protein is the food value which to a large extent determines the amount of beef or milk a given feed will produce. The market value of any feed is based on the amount of protein it contains.

Nearly all stock feeds fall short of the proportion necessary to proper balance, but alfalfa furnishes this needed element in abundance.

You should not buy protein if you can produce it on your own farm.

Too often on farms where alfalfa is not raised, an unbalanced ration is fed owing to the high cost of concentrated feeds. A large part of the otherwise necessary cash outlay for high protein feeds can be avoided by the use of alfalfa, the most economical ration balancer at the command of dairyman or stockman.

Alfalfa and corn make not only the cheapest but the best balanced ration. To feed corn and other grains alone wastes starch, and animals do not thrive as well as when along with the corn a rich, palatable feed, such as alfalfa, is fed.

Vermont Bulletin No. 61, says: "It is richer in digestible protein and a better soil and manure pile enricher than is any other plant of economic importance."

Circular No. 25, Michigan Experiment Station, says: "A ton of alfalfa hay contains 46.5 pounds of nitrogen, 12.2 pounds of



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phosphoric acid and 35.8 pounds of potash and that its total present value, if purchased as commercial fertilizer, would be about \$10.80."

Alfalfa hay can be raised for much less than \$10.80 per ton, in fact it can be sometimes purchased for this price. When this is the case one is actually getting the hay for almost nothing because in returning the manure to the fields, only 25.3% of nitrogen, 22.5% of the phosphorus and 12.2% of the potassium is lost.

The sowing of Scott's Seeds will keep the manure pile free from weeds.

Preparation of Seed Bed

It is not possible to plow timothy or blue grass sod for immediate planting of alfalfa, without having the growth of alfalfa greatly interfered with by the grass. A cultivated crop, such as corn should be raised the year before; then it is unnecessary to plow the ground unless it is foul or of a very heavy character.

If plowing is thought best it should be done in the fall, especially if early spring seeding is contemplated, for in seeding alfalfa the loose, open seed bed, such as is prepared in plowing a short time before seeding, should be avoided. It takes nearly six weeks for plowed ground to settle for alfalfa seeding. Otherwise, capillarity, or the power of the soil to draw the water to the surface, is interfered with.

The surface should be cultivated until the soil is as fine as a well-prepared garden. This top covering prevents evaporation, and thus keeps the soil warm, besides leaving the seed in complete contact with the soil which makes plant food easily available when the seed sprouts.

The young plants are likely to die in poorly prepared spots, these spots eventually becoming weed distributing stations. Hollows become filled with water and ice, which may kill the alfalfa.

Competition of Weeds. Poor Seed

The ground always contains weed seeds, and for this reason, thorough cultivation at intervals to kill them as they sprout is advisable. After going to this trouble it is surely unwise to sow seed that contains weed seeds which will sprout at the same time as the alfalfa and probably overcome it.

Lack of Fertility

While alfalfa is a deep feeder, drawing its food from greater depths than most plants, it is more tender than other clovers when young, and needs encouragement. Well rotted manure is the best fertilizer, but usually not available. Fresh manure on account of weed seeds should be applied to the preceding crop, or before plowing, the weeds being destroyed by frequent cultivation up to seeding time.



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Fertilizers

If it is impossible to use either of the above, commercial fertilizers should be used, especially on poor soils. We like bone meal best. Any fertilizer used should contain a large amount of phosphorus and some potash. Alfalfa gathers its own nitrogen, if inoculated.

Acid Land. Need of Lime

The percentage of lime in the ash of alfalfa is almost 35. nearly twice the percentage shown by red clover, and more than 7 times that in timothy. Lime is beneficial to most plants and to the legumes it is absolutely necessary. More lime is needed for alfalfa than for red clover.

If sorrel, dock, red top, or blackberry bushes thrive in your fields and clover does not, undoubtedly lime is needed. If muriatic acid poured on the soil fails to make bubbles, lime should be used. If limestone pebbles or shells are present lime need not be added. The absence of these, usually though not always, indicates the absence of lime. Valleys are not so apt to require lime as hills.

When in doubt about lime, use it, or consult your station.

A large crop of alfalfa cannot be expected unless the bacteria which find their home in the nodules on the roots are present. These bacteria gather free nitrogen from the air, and pass it on to the alfalfa, but they have no use for an acid soil.

Of the three forms of lime, the one that is the most economical in your section should be used.

One hundred pounds of raw lime rock when burned is reduced to 56 lbs. of burnt lime or quick lime. When this is water-slaked it takes up 18 lbs. of water, making 74 lbs. of hydrated lime. Therefore 56 lbs. of burnt lime or 74 lbs. of hydrated lime is equivalent to 100 lbs. of ground limestone.

Probably not less than two tons of ground limestone per acre should be applied and more will not hurt. Apply as long before sowing as possible, even a year in advance.

Drainage

All plants require air in contact with the roots. If there is too much water in the soil, the air is reduced, and root development retarded. A lesser top growth follows. Drainage takes off surplus water and admits air, causing circulation. Almost any wet soil, if properly drained, will raise alfalfa. The tile should be put in as deep as may be practicable.

Inoculation

A great many scientists have been giving years of study to the subject of inoculation. As far as we know every one of them agrees that it is necessary to introduce the proper bacteria into



the soil if the best stand of alfalfa is expected. The cost of time and material is small, so it scarcely pays to run the risk of partial or complete failure in order to save the trouble. Nitrogen is the most expensive fertilizing element. If the bacteria are supplied, alfalfa fills the soil with it at no cost.

Winter-Killing

Alfalfa seldom winter-kills on land well-drained. Any clover is apt to winter-kill if there is little humus in the soil. Ground containing plenty of humus is porous and ventilated; there are air spaces which favor the rapid carrying-off of excess moisture. Stiff clay soils that are devoid of humus become filled with water which in freezing weather forms ice and causes the soil to expand and heave, pulling out and breaking off the roots. Fields that carry red clover through the winter will do the same for alfalfa. If each year it is becoming harder to keep a stand of clover, put humus in the soil. Soils that contain humus are warmer than soils that do not.

Seeding

Alfalfa may be seeded at any time from early spring until late summer.

Where winters are particularly severe, spring seeding is favored. In milder climates, due to the early growth of weeds, fall seeding is desirable.

Do not clip alfalfa in order to kill weeds until it is in blossom or at least until the weeds are about ready to seed. This will kill the weeds in young fields. Early mowing may kill the young plants. The idea is to cut as many of the weeds and as little of the alfalfa as possible.

The alfalfa should not be allowed to form seed, for this requires plant food which should go to the roots.

Successful stands are often obtained by drilling the seed in the wheat fields in the early spring.

Sowing in the corn is a good gamble, if care is used to have the field free from weeds and in good order. A one-horse drill may be used, or the seed broadcasted, followed by a small harrow. If one cultivation is omitted, the alfalfa has a better chance on account of the earlier sowing.

Some sow in June, but we have found that foxtail and other weeds are still likely at that time to be a serious menace, and because we don't like weeds, we prefer to sow from July 20th to August 10th. This allows plenty of time for getting the ground in fine shape and for killing the weeds by cultivation. At this time the young plants receive full benefit of moisture, sunlight and plant food, as they sprout. Late seeding has many advantages on most soils. The land can be used for another crop before being prepared for alfalfa. During the first season the alfalfa plant needs to establish a deep root system to bring up food and moisture



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in future years. This growth of root depends upon the green leaves and stems above ground. With fall sowing there is little competition from weeds. The second year's production of hay will almost invariably be greater from late summer sowing in spite of the longer time for growing allowed by seeding in the previous spring.

Fertile ground does not require as much seed as poor ground. Poor seed will not go as far as good seed. Broadcasting requires more seed than drilling. Thus the amount required per acre varies, but as a general rule twelve pounds per acre will be found about the right amount. After sowing harrow lightly to cover seed and smooth out any furrows left by the drill, as a heavy rain may bury the young plants. Alfalfa seed should never be covered to a greater depth than one inch. The top soil should be left loose.

Improving a Good Stand

It is not always possible to thicken a stand where the plants are thin throughout the field, but if they are not over a year old the following plan may be used with success: Disk or otherwise cultivate the field and harrow after sowing. The proper time to do this is early in the spring before the old plants start. A thin stand from spring sowing may be improved by re-sowing in the fall if the rainfall is abundant. Ordinarily alfalfa, more than one year old, makes a growth that will shade and smother out young plants. In improving a stand of this kind, some recommend frequent clippings until the new growth gets started.

Harvesting

Alfalfa leaves contain twice as much protein as the stems, about twenty-eight per cent in the bud stage. This should be kept in mind when the hay is being made, and every means used to save the leaves. Where the leaves shatter in feeding they should be saved. When scalded and mixed with other feed for hogs they make an economical source of protein.

The Kansas Experiment Station found that the protein content of alfalfa when one-tenth in bloom is 18.5%, when in full bloom, 14.4%. For this reason the mature hay is better for horses. But for other stock the green hay, with the larger protein content is the more profitable. Providing new shoots have started the best time to cut is just as the field begins to show blooms. There should be an abundance of shoots about 1½ inches long. If too long they will be clipped by the mower and growing time will be lost, for alfalfa grows from the end of the shoot like a fern. Diminished yield results if the crop is cut too soon.

The basal sprouts are the best guide to cutting, but in dry seasons the new shoots are sometimes slow in appearing. In this case the blooms must be taken as the sole guide, for the feeding value diminishes rapidly as leaves are shed to protect the plant from the drought.



In wet seasons the second growth may be six or eight inches high before the blossoms appear. It is better to observe both the sprouts and blossoms before mowing. Crowding alfalfa with too frequent cuttings will weaken the roots for the reason that they will not receive enough food from the stems and leaves; and weeds and grass are not smothered out as effectually, for they will have more air and sunshine. Nothing is gained in the end by cutting a fourth crop.

If the hay is allowed to dry too rapidly this loss of leaves happens during the curing process. A little experience however soon demonstrates that alfalfa is easily cured.

Alfalfa may be put in the stack or mow damper than is generally supposed, that is while the stems are still quite tough or flexible.

Alfalfa should be let lie until the leaves are wilted then raked into windrows and then into cocks, until cured. A heavy crop may be tedded. Alfalfa may be stacked when so dry that moisture cannot be wrung out by twisting the hay.

Usually, the greatest growth is from the first crop, which is nearly always harvested during a rainy time and requires more care in handling. Later crops, harvested in mid-summer, may be cut in the morning, raked into windrows in the afternoon and put into the mow the next day.

Any kind of hay should be exposed to the hot sun as little as possible while curing. Too long exposure bleaches the leaves of alfalfa, and causes them to become brittle and fall off. Moreover, if the leaves have been burnt in the sun, they will not absorb the water in the stems and the hay will cure slowly and unevenly. Curing through the action of air and wind is best, therefore, alfalfa should be cured in cocks, instead of in the swath.

The greatest quantity of hay is harvested during the third or fourth season. After this weeds, grass, etc., weaken the stand and the yield decreases.

Pasturing

As a general rule it is best not to pasture alfalfa under any condition although some authorities say that it is safe to pasture when the crop is ready for making hay by turning enough stock on the field to harvest it quickly.

Cultivating Alfalfa

After the first year alfalfa may be cultivated with a spring tooth or special alfalfa harrow, immediately after cutting, when the soil is relatively dry. Grass and weeds, being comparatively shallow rooted are pulled out, but the teeth of the harrow slip around the deep rooted alfalfa plants without injuring them. This



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method of cultivation eliminates a serious objection to top dressing with manure which is usually full of weed seeds.

Disking is no longer recommended.

Leaves Turning Yellow

The first growth of alfalfa sometimes shows yellow. This may be due to lack either of humus, of drainage, or of lime. Sometimes it is because the young plant is feeding in the surface soil and the condition disappears when the tap root has pushed further down.

"Your name has been handed me by the Farm Crops Department of Ohio State University as being reliable seedsmen. I am in the market for seed corn, soy beans and alfalfa seed."

T. G. VICKERY,
Bluffton, Ohio.

"Received Soy Beans last year, which were satisfactory to all of our farmers. We will be in need of quite a few, as the ones we got last year spread the gospel."

R. L. OLSON,
County Agent, Red Wing, Minn.

"I have just returned from the Farmers' meeting at Lexington and was advised that your company was a reliable one from which to purchase clean seed."

L. G. CRUME,
Bardstown, Ky.

"I am glad to say that seeds you have shipped that have been planted are growing nicely and giving entire satisfaction. If I can use this to forward the sale of your seeds I will do it."

L. F. CHILDERS,
County Agent, Fayette, Mo.

"I shall be very glad to recommend any of our people who wish to sell to you, and you are well aware of the fact that you need no recommendation to our buyers. For your very fairness last year in price and quality you stand very high in the minds of our farmers."

W. A. OSTRANDER,
Purdue University, Lafayette, Ind.

"I shall be pleased to refer prospective buyers to you for various kinds of seeds. I am quite familiar with the high quality of seeds that you people handle and do not hesitate to direct Adams County farmers to you."

F. A. GOUGLER,
County Agent, Quincy, Ill.

"We received from you somewhat over a year ago a supply of grass seed which proved quite satisfactory to us. We are contemplating the use of about two bushels additional in the near future. Will you be kind enough to advise us the present quotations on the seed which we purchased from you."

R. H. CARR,
Secretary, Mount Union College, Alliance, Ohio.

"The seed which we purchased from you has given very satisfactory results."

BUTLER COUNTY FARM BUREAU,
R. C. Wiggins, County Agent, Butler, Pa.



Grimm Alfalfa

OUR 1919 Seed Book contained the following statement:
We believe so much in GRIMM ALFALFA that we plan to become a large distributor of this valuable strain. In order to achieve this position we are observing the two essential requirements:

First. We furnish seed practically free from weeds.

Second. We guarantee our GRIMM NOT to winter-kill.

The first we always have done.

The second is an undertaking fraught with some hazard because there have been winters when even GRIMM killed on some soils. The percentage of success is so high, however, that we provide this assurance with great confidence.

Here follows the first two paragraphs under GRIMM ALFALFA in our 1920 Book:

Last season we guaranteed our Grimm Alfalfa not to winter-kill. We did so as a means to obtaining a larger distribution of this desirable variety and to give the purchaser added confidence in our ability to supply the genuine Grimm. At the time this is written we have received no request to make good on this warranty and we expect none, inasmuch as we have sold seed from the same fields for five years now with but two or three complaints of winter-killing.

But Grimm does winter-kill sometimes and as we have but a limited stock, probably not enough nearly to supply the demand. we will not place the guaranty on our Grimm seed this year. Although we know it to be genuine a formal guaranty involves considerable risk and we will wait to see how our trial of this new idea turns out.

Inasmuch as our trial of a guarantee resulted in but two or three complaints, we will again sell GRIMM ALFALFA under the same arrangement.

We guarantee it for the purpose of dissipating whatever doubt there may be in the minds of prospective customers concerning seed purchased in a section distant from the place where first grown. This guarantee is designed to give sowers the necessary confidence not only in our GRIMM, but in the GRIMM strain as a safe and profitable crop.

To guarantee the seed to grow after it is in the ground would be impossible, as too many things can happen. But if the weather conditions permit the growth to come along all right, we will re-



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place the seed, willingly and cheerfully, if the plants do not go through the winter. GRIMM ALFALFA should, of course, be planted in ground that will carry red clover through the winter; ground where the drainage and other conditions are not unfavorable. North of the Ohio River, Alfalfa should be planted not later than August 10th because of the danger from dry weather, delaying germination so long that the plant will not get a good start before winter. We cannot guarantee GRIMM that has not reached a growth of 6 or 8 inches before it becomes dormant.

GRIMM will outstand ordinary alfalfa in wet ground, but it cannot be successfully grown on ground poorly drained. All investigators agree that it will do better on hard-pan soil than ordinary alfalfa, and it is the safest seed to sow in any part of the country.

As the Department of Agriculture and the Minnesota Experiment Station indicate, it is the inherent characteristics of the strain rather than the locality which first reared it that makes GRIMM ALFALFA HARDY.

The proof of genuineness is hardiness. There is no other positive proof. We GUARANTEE the hardiness of the GRIMM ALFALFA we furnish.

To guarantee GRIMM to be true to name, and to guarantee GRIMM not to winter-kill, are not at all analogous propositions. You never could prove that it was not GRIMM, but you certainly could prove that it winter-killed if that were the case.

Different winter conditions cause alfalfa to kill. A rainy fall prevents the plants from becoming dormant early, making them much more likely to winter-kill than following a dry autumn.

Alternate freezing and thawing in clay or in humus-poor soil will break off the roots. Sheet ice often kills alfalfa.

Grimm has the characters that enable it to withstand these conditions better than any other variety, and at the same time it is thought to be more drought-resistant than ordinary alfalfa. For this reason many believe that on an average Grimm will produce probably more hay than other strains.

Wendelin Grimm, a native of Germany, brought with him to Carver County, Minnesota, a small quantity of alfalfa seed. The seed produced exceptionally hardy plants, and when it was eventually recognized as a superior strain it became known as GRIMM ALFALFA.

As conditions in Minnesota are not favorable for seed production, only occasional limited crops were secured. But the demand grew and as its value became known sections more favorable to seed development were sought. Minnesota soil having pioneered the thing, that State acquired national fame as the producer of GRIMM ALFALFA although, as a matter of fact, there has been but very little of it ever raised there at all.



Mr. W. A. Wheeler, now with the Department of Agriculture, writing of the hardiness of GRIMM, says:

"I saw a field of it in Saskatchewan, Canada, in 1906, which had withstood the winter when the other stocks under trial were almost entirely killed out. In North Dakota, Minnesota and South Dakota it has always shown its hardiness, never to my knowledge having been excelled in this respect where a good comparison was made. It is a fact that at the Minnesota Experiment Station, the Grimm Alfalfa has to some extent been killed out under most severe conditions. It is well known, however, that there are conditions in the vicinity of the Twin Cities and many other portions of eastern Minnesota which are unfavorable for alfalfa, and these factors are to a large extent responsible for some of the failures in this region. In fact, the Grimm Alfalfa, in its adopted home near Excelsior, Minn., rarely produces seed enough to pay for cutting the crop for this purpose. * * * At the Minnesota Station the Grimm Alfalfa seems to be very much the more promising and this is highly recommended. The selection and breeding of alfalfa at this station has been handicapped by the fact that very little, if any, seed is ordinarily produced by the selected plants because of the unfavorable conditions of seed production."

Mr. R. A. Oakley of the Department of Agriculture, in Bulletin No. 757, says:

"When Grimm Alfalfa first began to demand attention, all of the seed was produced in Minnesota, but as conditions there are not favorable for seed production, stock was sent to Montana and other western states in order that the available supply might be more rapidly increased. Carefully conducted tests of Grimm seed produced in Montana, Idaho and the Dakotas indicate quite definitely that it has not decreased any in hardiness as a result of having been grown for one seed generation under these changed conditions."

These statements place all GRIMM distributors on the same basis. The producing sections are well-known, the market is open, and all handlers are equally well located to furnish GRIMM seed that is true to name. Our extraordinary bid for your preference is in the extreme care we take to furnish seed that is clean and free from weeds.

Just why GRIMM ALFALFA is so much hardier than other alfalfa has never been satisfactorily settled, but the principal reason generally accepted is its low set crown which affords protection to the tenderest part of the plant. It is also aided by the branching tendency of the roots. It is, however, difficult, to distinguish GRIMM from ordinary alfalfa by examining the root system. It does not show so large a percentage of branching roots as one would be led to believe from illustrations of selected plants and from some advertisements. Generally from 40% to 70% of GRIMM roots are branched, but a considerable per cent of the



roots of common alfalfa also show this tendency. There is not much difference in the blossoms except that Grimm when in full bloom shows a higher percentage of mixed or variegated flowers. The seeds of both are exactly alike. This gives appropriateness to another extract from Bulletin No. 757:

"The supply of seed on the market is still, however, rather limited and commands a high price. As a result, unscrupulous dealers have offered for sale large quantities of common alfalfa under the name of Grimm. Because of this practice, prospective purchasers should take every means possible to learn whether seed is true to name before buying."

GRIMM ALFALFA has a definite market value like any other standard seed. GRIMM at a very low price could not be true to name, and so would be an unwise buy.

We have sold our GRIMM to buyers who had purchased GRIMM elsewhere and found upon examination that it would be unfit to sow because of weeds. Seeds free from weeds is the corner-stone of our whole business.

In seed producing sections Grimm Fields are grown for seed almost exclusively, owing to the extra price which the seed brings. The weeds in an alfalfa field tend to increase more rapidly when the stand is allowed to remain for seed each year than when the field is mown regularly for hay. For this reason one should be especially careful in purchasing Grimm Alfalfa.

If you desire a field of genuine Grimm, free of weeds, you will not be disappointed if your seed order is placed in our hands.

"It may interest you to know that the Grimm Alfalfa to which you refer has produced a field of Alfalfa which our County Agent says is not equalled in Washington county."

DR. J. JOHNSON,
Hagerstown, Md.

"In the spring of 1919 I sowed four acres each of Grimm and Ordinary Alfalfa. This spring I got more than twice as much hay from the four acres of Grimm than from the four acres of Ordinary for the reason that the Grimm went through the winter in good shape, whereas the Ordinary suffered considerably. I will need more of the Grimm this year."

J. E. DUSANG,
La Rue, Ohio.

"Your seeds have always been very satisfactory."

WM. J. TENNEY,
Hamlin, N. Y.



Sweet Clover

BECAUSE Sweet Clover is a universal plant and can be grown in all parts of the United States the seed is very low in price this year. The growing season was a particularly favorable one and the acreage has been increased each year till now nearly every state is a large producer. We believe that it will continue in favor as it seems to be free from the diseases that are attacking Red Clover in many sections.

Its extensive root system enables it to gather the little plant food remaining in wornout and abandoned soils. The abundant root nodules store nitrogen and the decaying roots add humus. The deep penetration of the longer roots improves the drainage and after a crop of Sweet Clover the soil is always more friable and mellow, so that following it a good crop, even of corn, may be raised, though no profitable crop could be grown before.

By plowing Sweet Clover under we have gotten a satisfactory corn crop from raw, waxy clay which had been scraped from a new street.

Observe the uncultivated spots where Sweet Clover appears to grow the best. Organic matter, or humus, seemingly is not necessary, but these spots always contain lime and the ground is always hard. This indicates the method that should be employed in order to be sure of a good stand of this valuable plant. A firm seed bed should be prepared and lime must be applied if the soil is acid. In addition it is well to add phosphorus to ground deficient in this element. Inoculation is almost necessary, but Sweet Clover being such a rank feeder it is more easily inoculated than alfalfa. Either soil from an old field or commercial cultures may be used.

Sweet Clover prevents erosion on hillsides. It practically never freezes out during winter or spring. It is a weed-killing crop because of its rank growth. It builds up worn-out pastures and meadows. It will carry several times as much stock as ordinary pasture land. It contains more protein than Red Clover. Unlike alfalfa, it is not injured by pasturing. Plowing it up is easy, for although the roots are quite large, they are soft and decay rapidly.

Eventually it will be one of the principal crops in live-stock farming.

Bee keepers for years have recognized the value of Sweet Clover. The honey from Sweet Clover is of good color and flavor.

As a universal plant it leads even alfalfa, for it will grow not only in any climate but on soils where alfalfa fails. Where it is at first impossible to get a stand of alfalfa, Sweet Clover will furnish a profitable yield and at the same time prepare the ground so that there will be no difficulty in establishing alfalfa permanently. If



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the latter were the extent of its usefulness it would still be a valuable plant, for of course alfalfa has the advantage of being longer-lived and more productive.

Pasture

It is claimed by some that an acre of Sweet Clover will furnish pasture for five or six times as many animals as will the ordinary mixed grasses. While some stock will refuse Sweet Clover at first, they all soon get the habit, especially if turned into the field when the plant is small and tender.

During the first year grazing can start when the plant is about six inches high and can be continued until late in the summer.

When seeded on wheat fields during the winter or early spring an abundance of fall pasture is available when most fields are affording very little feed.

The second year Sweet Clover makes a quick, early growth and may be pastured sooner than any other plant. If a seed or hay crop is wanted it can be pastured until the middle of June, for grazing really benefits the stand by causing the plants to stool and make a larger number of branches.

When a field is used for pasture alone enough animals should be grazed to keep it eaten reasonably close. Then there will be a constant supply of small, tender shoots. Should the plants become coarse the pasture can be clipped to stimulate the growth of fresh shoots; setting the mower knife eight inches high.

Do not be afraid of pasturing too closely. Usually the more stock you turn on Sweet Clover the better.

If stock are removed about two months before heavy frost the pasture will reseed itself.

Besides furnishing the earliest pasture, it thrives during the hot, dry summer months and makes some growth after the first frosts.

One acre will furnish pasture for at least 20 shoats.

By maintaining two fields of Sweet Clover seeded in alternate years extremely profitable returns are realized from pasturing. The second year's growth of the first seeding is available quite early. When the newly seeded pasture comes on, the stock can be transferred to it and the old field left for hay or for seed, either of which will more than pay the expense of seeding and cultivating the field.

There is less danger of bloat than from alfalfa pasture.

As stock crave a dry feed when pasturing on Sweet Clover, it is often desirable to have a stack of straw or hay in the meadow.

Hay

For four or five weeks after germination, Sweet Clover makes but a slow growth above the ground, but the root system is devel-



oping, getting ready to meet unfavorable conditions, and as is the habit with biennials storing up food not only for this but also for the next season's growth.

The tap roots during the first season will sometimes reach a depth of thirty inches. The top growth is rapid after the plant has once become established.

Cutting First Year's Growth

The first year the crop should be cut for hay at about the time growth ceases. There are two important reasons for cutting at this time. In the first place, this season's growth does not become woody and it is safe to wait until the maximum growth is made. Second and more important, there is no danger of injuring the plants by cutting too close because the first growth of the second years starts from the crown. Shortly before the end of the growing season the crown buds are noticeable, after which it is safe to cut. This point is not generally well understood.

The fact that buds for new growth are all ready to start at the beginning of spring, along with its vigorous root system, makes it produce pasture so much earlier than other plants.

The first year, do not clip Sweet Clover during the summer unless absolutely necessary.

If the plant is clipped to kill ragweed or other weeds the cutter bar should be set quite high, for after being clipped there is no further growth from the main shoot, but dependence must be had upon the lateral branches for pasturage or for hay. As many of these should be left below the point of cutting as possible.

Cutting Second Year's Growth

"While the first crop in the second year comes from the crown buds, the new branches which produce the **second crop** of the **second year** come from the buds formed in the axils of the leaves on the flower portions of the stalks which constitute the first crop. These branches usually commence growth when the plants are about 24 inches high. In fields where the stand is heavy and where the lower portions of the plant are densely shaded, these shoots are soon killed from lack of necessary light. The branches which are first to appear and which are first to be killed are those closest to the ground. It is therefore very important when cutting the crop to cut the plants high enough from the ground to leave on the stubble a sufficient number of buds and young branches to produce a second crop.

"In fact, the stand should be cut several inches above the young shoots or buds, as the stubble may die back from one to three inches if the plants are cut during damp or rainy weather."

We quote from U. S. D. A. Farmers' Bulletin No. 820. This explains very clearly why care should be used in cutting Sweet



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Clover. We advise reading of this bulletin as well as Mr. Coe's other Sweet Clover Bulletins, No. 797 and No. 836.

Hay cut the first year is fine-stemmed and palatable.

Hay must be made the second year before the bloom buds appear as the plants become woody about this time.

The hay is cured in the same manner as Red Clover or Alfalfa, but being more succulent a longer time is required.

As in handling other clovers, the idea is to get rid of the water gradually instead of allowing the leaves and stems to be burnt by the sun. This saves the leaves, the most valuable part of the plant. The hay should lie in the swath until well withered and then be raked into windrows. The next day, if sufficiently dry, it must be put in cocks and cured. The cocks should be of such size that they can be loaded in one forkful in order that as few leaves as possible be lost.

Seeding

From a labor-saving standpoint, at least, probably the best time to sow Sweet Clover is during the winter any time from January to April on corn ground or other bare ground. Freezing and thawing will bury the seed and cause the hard grains to germinate, there being quite a large percentage of these in any Sweet Clover that has not been scarified.

Even when the laboratory test shows the germination of Sweet Clover to be quite high it will not respond to moisture as quickly as Red Clover, more rain being needed even when the seed has been scarified. For this reason growers are sometimes surprised to find that they have a poor stand of Sweet Clover while in a neighboring field sowed with Red Clover at the same time, the growth has been entirely satisfactory. However, as a rule, under field conditions, Sweet Clover shows a larger percentage of germination than in the seed germinator.

A firm seed bed is important, so where necessary to plow, if possible the ground should be plowed in the fall and harrowed down, the seed being broadcasted during the winter months. However, seeding may be done in April or May on a well prepared, firm seed bed with just enough loose soil to cover the seed. Like any other clover, Sweet Clover may be seeded on wheat or rye in the spring, or with oats or barley.

August seeding is not desirable in most sections, for then the plant lasts but one growing season and does not reach its largest development. Many sow during June or July; some as late as the last of August. The Virginia Experiment Station recommends sowing in August for pasture and hay crops the following year.

While Sweet Clover, once it is established, is very drought-resistant, the plants when young must have an abundance of moisture on account of the deep growing roots.



Too heavy seeding means that young, small branches and leaves on the lower part of the stem will be killed by the crowding. This necessitates higher cutting and makes less and coarser hay.

Inasmuch as Sweet Clover has a hard seed coat, scarifying has proved to be a profitable operation.

It requires ten or fifteen pounds of this seed to the acre; when the unhulled seed is used fifteen or twenty pounds. The scarified seed is best for summer or fall sowing for the germination is more rapid. For winter sowing possibly the unscarified, hulled seed is to be preferred. We furnish this or the scarified seed at the same price.

It should be kept in mind that Sweet Clover will grow on any kind of soil if lime is present. If not, this should be added for it will wonderfully increase the yield. The addition of phosphate where needed is advisable.

Seed Production

When a seed crop is to be saved, Sweet Clover should be first pastured or cut for hay. The stock should be removed from the pasture early enough to assure the maturing of seed; if hay is made, the cutting should be reasonably early, thus assuring a larger number of branches. Of course the mower should be set high, as new shoots will come not from the crown but from the axils of the lower leaves.

The mower, however, is not as satisfactory for cutting Sweet Clover as the binder, for the reason that too much handling is necessary. The self-rake reaper is best but a binder can be equipped at small expense for handling the clover economically and with small loss of seed. Corn harvesters are sometimes used if the growth becomes too large to be cut with the binder.

A very thin stand produces a surprising quantity of seed when neither clipped nor pastured.

Cutting should be done when about three-fourths of the pods have turned dark, and only when damp from dew or rain as the seeds shatter easily. For this reason when cut with a mower the swath should not be run over.

When cut for hay or pastured the late plants are smaller and are harvested more easily, for the binder can be used. This facilitates handling and makes it possible to use a huller, otherwise it is sometimes necessary first to thresh the coarse straw and then run the seed through the huller. Seed is easily flailed out after being thoroughly cured.

In Mixtures

A mixture of Rape and Sweet Clover makes excellent hog pasture, seeded at the rate of five pounds of Rape and ten pounds



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of Sweet Clover. To this may be added a bushel of Soy Beans drilled by themselves.

Renovating Old Pastures

Worn-out pastures are often successfully renovated by disking in the fall and sowing a few pounds of Sweet Clover during the winter. Not only is the amount of pasturage increased by the Sweet Clover, but the grasses will be improved owing to the addition of humus and nitrogen furnished by the Sweet Clover. The same plan may be followed in the spring but not as successfully. The Sweet Clover should be drilled in.

There are a large number of varieties but only two are of value in this country, namely, White Biennial (*Melilotus alba*), and Yellow Biennial (*Melilotus officinalis*).

While the white on account of its larger growth is the most popular variety the yellow biennial is preferred by many for both pasture and hay on account of its finer and more branching stems. It seems to be a larger producer of seed. It has the advantage of maturing about two weeks earlier than the white. In four different tests at the Ohio Experiment Station the white produced 10% more hay.

When Sweet Clover is mentioned without any special variety being named it is always understood that the white is meant.

Care should be used in buying Sweet Clover. The seed does not mature evenly and if not well cleaned many dead grains are left in. Hard grains are always present and there is much danger from weed seeds. We take our usual pains in selecting seed that is free from weeds, and in cleaning it, and scarify it if desired.

We have prepared a special chart "Sweet Clover Questions and Answers," which will be sent on request. It contains in handy form about all the information obtainable on Sweet Clover.

"Wish to mention that the trial order of Sweet Clover I received from you was A-No. 1. Upon examination of the field which was seeded with the Sweet Clover, I find that it has started to grow very nicely and apparently seems to be a fine catch."

J. M. HOLLOPETER,
Rockton, Pa.

"Your seeds proved to be the best I ever bought."

A. C. SMITH,
Fraziers Bottom, W. Va.



Red Clover

RED CLOVER was first cultivated in Persia. It was carried to Spain and Italy in about the 16th century and was soon introduced into Holland. From Holland it was taken to England and in about 1770 to Pennsylvania.

Red Clover is often called June or Medium Clover, the latter term to distinguish it from Mammoth.

Of all clovers Red is the most popular. Many feel that there is little need for other clovers where the Red can be grown. It is widely distributed through Europe and the United States and Canada but unfortunately many soils that formerly grew Red Clover are now finding its cultivation difficult.

This is caused by one or more of the following conditions: fungus and insect diseases; the exhaustion of potash; acidity; lack of nitrogen gathering bacteria; lack of humus or organic matter.

Humus provides ventilation, binds the soil together and increases its water holding capacity, prevents winter-killing and retains plant food for bacteria.

Much can be done to make "clover sick" soil again productive by restoring organic matter through the application of stable manure. Liberal application of lime will sweeten it and make conditions favorable for bacteria. Fertilizer rich in phosphorus and containing some potash is best for most soils. Even though Red Clover has been raised on the field in former years in many instances it will be found advisable to inoculate.

After clover is several weeks old the roots shorten and draw the crown of the plant into the soil. This protects the plant and prevents winter-killing.

While Red Clover is recognized as a biennial, if favorably located it may last four or five years. It is observed that, when sowed with Timothy, the third year from seeding the stand is about half and half; the fourth year mostly Timothy.

Red Clover has always been popular for pasturage because it starts new growth quickly when eaten off. It gives a large yield of hay which is easily cured. The second crop can be utilized for hay, pasture or seed.

Red Clover is not adapted to stiff clay or worn-out soils. On these soils Mammoth is much to be preferred.

Best results are usually obtained from spring sowing and for best germination the seed should be drilled in. In some sections of the country where spring sowing fails, summer seeding has proved advisable. Especially is this true south of the Ohio



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river. The plants escape the hot dry weather of mid-summer which often kills or weakens them.

It is often the practice to cut Red Clover too late. If the bloom begins to ripen the plant is injured. If cut when just in bloom the second crop will be heavier, there will be no danger of harming the plants and the hay will be more palatable. Red Clover after being cut will not stand as much rain as either Alfalfa or Soy Beans. Thus it pays to cure it and get it in the mow or stack as quickly as possible. If cut in the afternoon when it contains less moisture it can be teddered the next morning and windrowed, shocked and mowed the same day. Partly cured Red Clover hay will not stand a thorough soaking.

Red Clover matures about the same time as some of the worst weeds, as for instance buckhorn, wild carrot, sorrel and dodder. For this reason it is more difficult to find Red Clover free from weeds than any other variety.

We give especial attention to Red Clover seed because we sell more of it than any other. We have always been able to supply seed practically free from weed seeds and waste matter and we expect to continue to do it.

Quite often a customer sends us a sample of Red Clover which he can buy at a less price than ours. Invariably this seed contains buckhorn and other weeds. No one has, however, ever told us that he could buy better seed than ours. We quote from Farmers' Bulletin No. 260:

"First-class Red Clover seed should contain very few weed seeds. This means at most but a few hundred and should mean less than 100 in each pound. Even this seems a large number, but clover seed production has not yet received that special attention which insures perfectly clean seed, and a few hundred weed seeds per pound constitute a small number when compared with the thousands and tens of thousands of weed seeds per pound found in many samples of Red Clover seed."

As Europe is a large producer of Red Clover much of it is imported, especially when our crop is short. The country was full of imported seed last year. It always contains weed seeds and is by no means as hardy as the native.

"Both your seed and service have been absolutely satisfactory in every particular."

R. A. SHORT,
North Rose, N. Y.



Mammoth

Warranted True to Name

MAMMOTH CLOVER, also called English, Sapling, and Pea Vine Clover, like red, is a biennial, but where soil and climate are particularly favorable, or where prevented from producing seed, it is likely to show a perennial tendency.

As Mammoth Clover matures about three weeks later than red it is better suited for sowing with timothy or red top, red clover being overripe at the proper time for harvesting either timothy or red top.

Mammoth grows to a greater height than red, has larger roots that penetrate to a greater depth, and for this reason will often do well on soils where medium clover will make an unsatisfactory growth, the vigorous growth of the Mammoth enables it to gather more plant food from impoverished soils.

On poor soils Mammoth makes more desirable hay because the growth is not so rank. The long roots enable it to withstand drought and winter-killing better than red. On sandy soil it is superior to red clover which it excels as a green manure crop on account of its large growth of roots and stems.

While the hay is coarser than red clover hay it has the advantage of ripening a month later at the time when there is less danger from rain.

If a seed crop is to be made the clover should be pastured until about June first or clipped, otherwise the plant is likely to exhaust itself in the production of stems and leaves. If the weather is especially dry care must be used in pasturing as the plants may not receive enough growth to produce a large seed crop. On very poor soils it may not be necessary to pasture at all.

Mammoth makes a much surer crop of seed than red. It matures seed about three weeks earlier. Some growers assert that seed is produced just between two broods of clover weevil which often do much damage to red clover.

The very heavy growth usually smothers out most of the weeds and as a result we can always furnish Mammoth that is free from weed seeds. It seldom contains blasted grains.

Mammoth is supposed to be less subject to diseases than Red Clover. This may be because of its more vigorous growth and long roots which draw plant food from a great depth.

The seeds of Mammoth and Red Clover are so nearly alike that they cannot be distinguished. This likeness has resulted in much



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annoyance for the grower. We used to receive dozens of letters each year asking how we knew our Mammoth was true to name, most of the writers stating that they had more than once sowed Mammoth and been compelled to reap a crop of Red.

This seemed to be the common experience all over the country. We finally got tired of assuring people that they would find our seed true to name and have for several years answered this question by guaranteeing the genuineness of any Mammoth Clover purchased from us. In other words we will refund the purchase price should any of our Mammoth seed produce a crop of Red Clover. As stated concerning Grimm Alfalfa we cannot guarantee any seed to grow after it is planted, but, weather conditions permitting the crop to grow we will gladly make the refund.

We have sent samples to the Department of Agriculture and elsewhere for test plots. In each case our seed grew true to name while lots from some other sources did not.

If you have had trouble in getting genuine Mammoth, especially if you have been unable to procure this seed entirely free from weeds, you may be assured that in our Mammoth you are getting the kind of seed that you want.

"About the last of next month I expect to place an order with you for eight bushels of Mammoth Clover Seed. Previous to the time I hope you will be able to set aside some exceptionally fine seed for me, like that you sent me three years ago."

C. P. HARTLEY,
U. S. Department of Agriculture, Washington, D. C.

"The Mammoth Clover that I have been buying of you has always proved true to name and was strong in germination and free from weeds."

K. L. BURDETTE,
Ronceverte, W. Va.

"Your seed and service were more than satisfactory. If ever in the market for seeds I would want to do business with you."

JOHN C. METZGER, JR.,
Yulan, N. Y.

"I can recommend your seed to every farmer. It is just as you represent it."

FRED H. LEAR,
Patriot, O.



Alsike

ALSIKE seems to have been first cultivated near the village of Sike or Alsike, Sweden, and to have been introduced into England in 1834. It is not known when it was brought to America. On account of its appearance and habit of growth it was once thought to be a hybrid between white and red, but is now supposed to be a distinct species.

While not strictly a perennial it usually remains in the ground for several years. Enough of the heads escape the mower and the grazing of stock to do much toward reseeding. It is not nearly as particular about acid soils as red clover and will withstand winter-killing much better. It should be used in mixtures on any type of soil where the seeding is to remain more than three years. In this respect being preferable to red which dies in two years.

It is particularly adapted to wet soils, sometimes doing well in standing water.

Being free from the diseases that affect red clover, it will grow on most soils even those that raise an indifferent crop of red.

The hay is finer than red clover hay and is preferred by stock but less is produced per acre.

Alsike gathers nitrogen from the air the same as red clover. and would be as valuable in the rotation as a soil builder except for its smaller root and stem growth.

Alsike and timothy ripen together and the alsike does not crowd the timothy as badly as red clover does. For these reasons alsike is preferred for growing along with timothy. Because the alsike does not crowd, it is often sown with red clover. It interferes but little with the growth of the red clover and should the latter fail to grow or be killed the alsike will quite likely take its place. Often alsike, on account of its spreading roots, will keep the red clover from "heaving" out. Much less alsike than red clover should be used.

Except where grown for seed it is usually best to sow some other seed with alsike, such as timothy, orchard grass, blue grass, or red clover.

A good hay mixture is 3 parts timothy, 2 parts red, and 1 part alsike.

South of the Ohio river Alsike, Red Top and Orchard Grass make a desirable mixture for a semi-permanent pasture.

There are approximately 700,000 alsike seeds to a pound, and 250,000 in a pound of red clover, so it takes much less of alsike to sow an acre of ground.

As the seed is so small it should be lightly covered.



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Probably because of acid soil, Canada thistle, sorrel and buck-horn infest many of the sections where alsike is raised for seed, so it is well to look out for these weeds when testing samples. They cannot be entirely removed in cleaning, as many of the weed seeds will be the same size as the alsike. This is especially true of Canada thistle.

Owing to its smaller size alsike is hard to clean, but, by using care in selection, we are always able to furnish seed that is practically weedless.

As Alsike goes three times as far as Red, one bushel is enough for at least fifteen acres.

Quite often we have alsike which contains a little timothy seed that we sell at a special price.

Crimson Clover

CRIMSON CLOVER is said to be a native of Southern Europe. It was introduced into Chester County, Pennsylvania, in 1820, but, until 1880, its distribution was quite limited.

Crimson Clover is a winter annual, that is, being sown in late summer it goes through the winter in a green state and matures its seed and dies in the spring. It will seldom stand the winters north of the 40th parallel.

Practically all of the Crimson Clover sowed in this country is imported from Europe. This means that the seed usually contains the seed of noxious weeds so that a careful examination should be made before buying. Use our test.

White Clover

WHITE CLOVER is usually called White Dutch to distinguish it from White Sweet Clover. White Clover is a native of America.

Many alsike fields contain White Clover. When the seed is harvested the two cannot be separated. Sometimes we have this mixed seed at prices lower than when the two seeds are bought separately.

Japan or Lespedeza

THIS was brought to us from Japan. It was first introduced in South Carolina and is becoming popular in most sections of the South. It is an annual. It has deep roots and will grow on very poor soil, but, unlike Crimson Clover, does not do well on sandy soils.

As this clover is sold in an unhulled conditions it usually is very poorly cleaned and full of waste matter. Those in the habit of sowing Japan Clover will be surprised at the quality of our seed.



Soy Beans

THE soy bean is a native of Eastern Asia, coming from China or Southern Japan. In this country it has been an important crop for about twenty years.

More soy beans than ever before were planted during 1920. The season was decidedly favorable for seed production—the best we have known for years. As a result we have a large supply of unusually sound, high germinating beans at a reasonable price.

We are always glad when weather at harvest time is such that beans can be cured and threshed without too much rain, for the germination of soy beans is easily affected by unfavorable conditions. Often the percentage of germination is lowered decidedly in a short time for reasons not easily explained. This cannot be the case during 1921 for all the beans that we have seen are well cured and free from moisture.

Several years ago we were convinced that in a short time Soy Beans would be used on nearly every farm. Naturally we wished to become a large distributor of them and to that end we have tried to supply all varieties with special attention to germination and purity. We believe that we are now selling a good many more beans and more varieties than anyone else.

Clover is so often a failure that it is necessary to find some legume that pays as large returns and at the same time is a sure crop. Soy Beans not only gather more nitrogen from the air than clover but have a larger root system. Thus even though the crop is saved for hay or is pastured instead of being plowed under, the benefit to the ground is as great as from clover as is indicated by the large yields of wheat and corn following a well inoculated crop of Soy Beans. The Ohio Experiment Station found that wheat yielded 10.3 bushels more to the acre on this sort of ground than on corn ground.

The Soy Bean is used for green manure, hay, forage, grain and silage.

It is probably the most desirable leguminous catch crop.

Invaluable to fill in with in case of failure of clover seeding or other spring crop.

The Soy requires from 90 to 150 days to mature. Some of the varieties will mature as far north as Northern New York, but the plant having originated in a warm climate, many varieties will not ripen except in the South.

It will grow in poor soils and increases the fertility of the land by means of the nodules on its roots. It endures drought, and stands excessive moisture fairly well.



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They are more frost resistant than corn or field beans. Light Spring frosts will not kill the young plants and they are seldom injured by frosts in the fall when maturing.

The plant is moderate in its fertilizer requirements. Lime, applied previously to seeding, should be used on acid soils, though liming is not as essential as with other legumes.

Soy Bean hay resembles alfalfa hay very closely in percentage of protein.

Alfalfa Hay.....	14.3 Per Cent Protein
Soy Bean Hay.....	15.4 Per Cent Protein

As might be expected trials made at experiment stations show that for milk and butter production Soy Bean hay is nearly as good as alfalfa hay. Cattle will leave corn to eat it. It is invaluable to fill in with in case of failure of a clover seeding or of a spring crop.

The forage produced by the Soy is higher in protein than any other annual crop of equal yield.

Meal from the Soy Bean has none of the bad effects of cotton seed meal. When mixed with six parts of corn, a bushel of Soy Beans has the feeding value of three bushels of corn, that is, six bushels of corn and one bushel of Soy Beans amount to the same thing as feeding nine bushels of corn.

We can nearly always supply cull Soy Beans, either whole or ground. As the analysis is 40% protein and 20% fat they are richer and are much superior to linseed or cotton seed meal.

Experiment stations are urging that Soy Beans take the place of oats in the rotation. By planting corn and beans together, then Soy Beans alone either for hay or grain, followed the next year with wheat and clover, a legume is on the ground continuously. As an average crop of Soys, if inoculated, will store up as much as 125 pounds of nitrogen per acre, it can be seen what they will do for soil improvement when used in this way.

Seeding

In seeding Soys the seed bed should be prepared about the same as for corn, cultivating at intervals in order to kill weeds, for, like alfalfa, young Soy Bean plants are easily crowded out by a rank growth of weeds. They should be planted about corn planting time but not until all danger of frost is past and the ground is warm. The seed should be planted not over 1 to 1½ inches deep. If a seed crop is expected it is best to plant as early as possible but for hay or green manure even into August is not too late, the variety used making some difference. Although solid drilling requires more seed to the acre and in wet seasons there may be some annoyance from weeds, many growers prefer this manner of planting for hay, silage or green manure crops. From



4 to 5 pecks are used. Laboratory experiments in New Jersey point to an increased or intensified use of atmospheric nitrogen where legumes are planted close together. When so planted there is possibly a greater recovery of nitrogen from the air per acre. Thick seeding is probably best for sandy soils. Planting in rows saves seed and permits cultivation.

Planted after wheat or oats are removed they will usually produce a paying hay crop. In any case they will be invaluable for soil improving or for pasture.

Last summer we planted test plots at different dates, the beans making growth up to October 20th as follows:

	Inches
July 10, 1920. Early Brown	25
July 10, 1920. Virginia	60
July 14, 1920. Early Brown	21
July 14, 1920. Virginia	40
Aug. 7, 1920. Virginia	20
Aug. 19, 1920. Early Brown	13½
Aug. 19, 1920. Virginia	20

The beans were planted on excellent ground and the season was favorable.

In weedy ground it is best to plant in rows but Soys drilled solid can be cultivated with a weeder or slant tooth harrow. This should be done during the middle of the day when the beans are dry and tough. Do not cultivate until the beans are three inches high nor after they have reached a height of eight inches.

For seed the beans must be drilled in rows and cultivated. A grain drill can be used for drilling in rows by covering up the necessary feed holes. This requires from 15 to 25 pounds of seed according to the size of the beans. The rows should be 28 to 30 inches apart with the beans 2 or 3 inches apart in the rows. When a corn planter is used, some recommend attaching a shoe at the planter runner for regulating the depth. For solid drilling use the oats feed of an ordinary grain drill adjusted to drill, say 75 pounds per acre.

Cultivation

As the entire bean is pushed out of the ground in sprouting, in case a heavy crust forms, it may be necessary to harrow the ground lightly before the beans sprout, or even as they are coming through the ground, but this should be avoided if possible. Unless weeds are getting the best of the beans they should not be disturbed until three or four inches high, when they are quite tough. When planted in rows the beans can be cultivated until blossoms appear but should not be disturbed after this.

In Corn

When planted with the corn Soys may be "hogged off" or "lambd off," or cut with a binder for putting in the silo. When



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the former, the lambs or pigs are turned in when the corn is about ready to cut for fodder and the Soys have begun to ripen. Pigs up to 50 or 60 pounds and the lambs will eat the beans without injuring the corn if it is desired to harvest it. If the entire crop is to be pastured, sheep or hogs of any size may be turned in. They take on fat and improve in general condition wonderfully. It is a good plan, if convenient, to feed Soys to stock a few days before they are put into the field so that they will become accustomed to, and eat the beans readily, otherwise the larger animals will favor the fresh corn. Beans are so rich in protein that it is not necessary to feed tankage or any other protein feed.

For hogging off or for silage the beans are planted right in the rows with the corn. A special attachment can be gotten for the planter that makes it possible to do the whole job at once, or the corn may be drilled first at the regular depth and then the drill filled with the beans, going back over the corn rows, being careful to plant the beans no deeper than one inch. The corn is planted about 18 inches apart and the beans about 6 inches apart in the rows. This requires 6 to 10 pounds of beans. If the planter has a fertilizer attachment the beans may be mixed with the fertilizer or with dust, drilling the mixture as fertilizer. Corn and beans may be mixed together and drilled, but this is not a very satisfactory arrangement.

For hog or lamb pasture, use early Soy Beans and early corn.

Soys should be planted in all corn fields when possible to utilize them, unless the fields are inclined to be very weedy. As they gather nitrogen from the air and the corn gets some of this, the growth of the corn is not lessened and even though it were, the benefit to the ground and the extra forage would more than offset the loss. At least one ton of silage or soiling is added to the field. Many report yields of two tons, a large profit at practically no expense.

Last year we sold a good many soy beans for broadcasting in corn just before the last cultivation. Under normal conditions this crop is worth while for hogging down or for soil improvement. One man plants them in corn each year for soil improvement, so that he can raise corn on the same field year after year. This late in the season we usually have a few varieties left that we can sell at a special price.

For Silage

The addition of Soys gives the silage a much greater feeding value as they contain 145% more digestible protein and 40% more fat than the corn silage. Of course Soy Bean silage contains a very much greater amount of protein when the beans are allowed to form in the pods. It should be kept in mind that, like corn, different varieties of beans have different dates of maturity and that the variety to be selected is the one that not only makes a maximum growth of vine but also develops beans by the time the corn is



ready for putting in the silo. If the beans are grown in separate fields three loads of corn run through the cutter followed by a load of Soy Beans makes a well-balanced feed. They can be used much riper than for hay as they go into the silo without curing and the juices of the corn soften the stems. The harvesting is done with a binder just as the corn alone would be harvested.

The addition of Soy Beans to the silage makes the purchase of oilmeal and tankage unnecessary and greatly increases the flow of milk.

Cornell University in a series of experiments found that non-leguminous plants grown with legumes contained a great deal more protein than when grown alone. As an example oats grown with field peas contained 7% more protein than oats grown alone; timothy with red clover 44% more. It seems reasonable to suppose that corn grown with Soys should contain more protein than when grown by itself, especially if the Soys are inoculated.

For Hay

Soy Bean hay in curing will stand more unfavorable weather conditions than red clover or alfalfa. The plants should be cut when the pods begin to fill and a few yellow leaves are showing. Well-matured hay may not be so palatable but is more easily cured. When once started the harvesting should be completed in as short time as possible as the leaves fall rapidly when ripe. They may be cut with a mower and left on the ground until wilted; then raked up and placed in tall loose cocks for a week or ten days. A good method, however, is the use of the self-binder, setting the small bundles into cocks to cure

For Seed

The seed cures to best advantage on the stalk so beans should not be cut until absolutely necessary to prevent loss from shattering. A good guide is to wait until most of the leaves have fallen off. If the beans are well ripened it is possible to thresh in a day or two after cutting. If the beans are not allowed to get thoroughly ripe, and some varieties must be cut early or too many beans will be lost, the beans should be kept in cocks until thoroughly cured, otherwise the seed may be damaged when stored in bins or sacks. Cut when dew is on the ground. Some of the large growers of seed cut with a binder just as soon as the top leaves turn yellow, allowing the small bunches to lie three or four days according to the weather and then put in small shocks, reshocking at the end of ten days if the weather is favorable. In four or five weeks the beans are thoroughly cured. This leaves a large amount of leaves on the straw, most of which are lost if the beans are allowed to ripen thoroughly. Some are now using the southern soy bean harvesters, which gather the beans from the standing stalks.



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Threshing

An ordinary grain separator can be used by removing the regular concave and using a blank or board. The speed must be cut down so as to avoid splitting the beans. Special bean separators can be purchased at reasonable prices. Soy Bean straw is relished more than any other straw by sheep, cattle and horses.

We find that a great many of our customers are using corn shredders for threshing their beans.

Inoculation

There is no question at all but that Soy Beans should be inoculated. They may grow nearly as well without inoculation but will do this at the expense of the soil. When inoculated the roots become filled with large nodules which make them the ideal crop for soil building. There is also little doubt that when they are inoculated the protein content of the plant is greater. For reasons stated before we believe it is especially important to inoculate Soys that are to be planted with corn. In 99 cases of out 100 "no inoculation means no nodules."

Soy Beans in Mixtures

Soy Beans may be mixed with cow peas, sorghum or sudan grass, making a balanced forage; about ten pounds of sudan grass or fifteen pounds of sorghum with three pecks of Soy Beans broadcasted, make hay that is easily taken care of.

YELLOWS

Ito San

This small yellow bean is one of the best known varieties. It is a heavy seed producer, grows to a height of about 24 inches and matures in about 105 days. Owing to its early maturity it is excellent as a catch crop. A good variety to sow with corn for hogging down. Although rather short it ranks well as a hay producer.

Elton

An early bean that matures just a few days later than the Ito San, but makes a larger growth. Good for planting in early corn. It is a large seed producer, and makes early hay and excellent hog pasture.

Manchu

An early variety somewhat larger than the Elton. Matures in about 110 days.

Hollybrook (Northern)

Matures in 120 days, growing about 36 inches tall. It is a fair producer of seed and hay but is particularly desirable for



planting in the corn as it is tall and slender, the lower branches being high enough to miss the binder knives.

Mongol

This bean was formerly called Medium Yellow. It is suitable for silage or hay and is a large seed producer. It matures in 115 days. The plant grows to a height of about 30 inches with medium sized stems and an abundance of foliage, making it an excellent hay variety. It is very much like the Medium Green, is a much heavier yielder and will not shed its leaves so readily nor shatter as badly.

At the Ohio Experiment Station in a four-year test it yielded 25.95 bushels of beans to the acre as compared with 22.71 bushels yielded by the Medium Green.

This bean will be entirely satisfactory in the New England States as an all-purpose bean to substitute for the Medium Green which has always been popular there.

A. K.

This bean was first grown by the Illinois Experiment Station in 1914 and named A. K. because the shipping tag attached to the bag containing the sample sent for experiment contained these letters. It proved satisfactory and has had considerable distribution in Illinois. It is about five days earlier than the Mongol. It is a good bean for hogging down and makes good hay, but is inclined to shatter more readily than some varieties.

Mikado

This variety grows to a height of about 32 inches, maturing beans in 120 days. It is excellent for grain, hay or silage, but the stalks and branches are somewhat coarse.

Haberlandt

This is one of the most productive varieties. Has large, yellow seeds, grows to a height of 36 to 40 inches and matures in about 125 days. This makes it a little late for ripening seed north of the Ohio river although it is excellent for hay and silage any place.

Mammoth Yellow

This is a late southern grown variety, maturing in about 145 days. It will not ripen beans north of the Ohio river but is grown to some extent for hay as far north as the New England States. We recommend an earlier kind for either hay or silage. For soil improvement Mammoth Yellows will be found more economical than any other variety on account of the lower price.

Owing to the excellent quality of the seed and the shortage of earlier beans some may find it wise to plant the Mammoth this



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year for hay or the silo. But for silage we think it especially important to use an earlier variety so that beans will be formed by cutting time.

Medium Yellow

There is some confusion in the names of Soy Beans owing to carelessness and the fact that some growers have given a name of their own choosing to well-known varieties. This is especially true of the Medium Yellow. It has been called Early Yellow, Mongol, Roosevelt, Hollybrook, etc. We still have some demand for "Medium Yellows" but advise growers to purchase under some other name to be sure of getting what is wanted.

BROWNS

Early Brown

This is practically the same bean as the Ito San but seems to be hardier. Mr. E. E. Evans, of Michigan, who introduced both, tells us that the Early Brown, besides being somewhat earlier, is a better all-round variety than the Ito San.

We have found this to be true. It shatters less. We notice particularly this season that while the Ito San has split badly the Early Brown has not been affected in this way. It is a larger and more profitable producer of seed. Unfortunately many Southern growers sell a brown bean as Early Brown which is about as late as the Mammoth Yellow and no more desirable. The bean can be recognized if compared with the true Early Brown as it is larger, rounder and a darker brown.

Ohio 9035

This bean matures seed in 120 to 125 days. It is one of the best beans developed by the Ohio Experiment Station which probably has done more work with Soy Beans than any other station. It is an erect bushy plant growing to a height of about 30 inches. The leaves are large. For Central Ohio and farther south there is no better variety either for hay or for seed production. Farther north, where a large quantity of hay is desired, it will be found to excel most other varieties. It probably resists shattering better than any other bean, an excellent point in its favor.

Virginia

All our customers seem to agree with Mr. Morse of the Department of Agriculture that the Virginia is one of the very best hay and silage beans. On ordinary soil it would grow to a height of fifty inches. Both the stalk and branches are slender with binding terminals, thus making a fine and palatable hay. It matures in about 125 days. The seed has always been quite scarce but we hope to be able to fill all orders this year.



BLACKS

Most of these have fine stems and leaves and are desirable for hay and for silage, but many growers prefer the larger and coarser yellow beans for the latter purpose. As the hogs cannot find the black beans the yellow kinds are more suitable for hogging down. In blacks the same variety often goes under several different names. We have found the Wilson, Sable, Sooty, Jet, Pekin and Arlington to be very much alike. Experiment Station reports vary greatly as to time of maturity and other characteristics.

Sable

The Sable matures in about 120 days; erect, growing to an average height of about 36 inches. It has a small stem and thin branches which make it desirable for hay. It is probably a heavier yielder of grain than other black varieties.

Wilson

It matures in about 120 days, growing as high as 4 feet. It is inclined to vine more than the Sable and the pods are somewhat higher from the ground. It is very popular but as the seed is always scarce we recommend one of the other black varieties as second choice in ordering.

Pekin, Jet, Sooty

Our test plots show these to be much like the Sable. Most blacks including the Sable seem to be selections from the Pekin.

Ebony

Bushy, with fine stem and branches. We have found it earlier and smaller than the other varieties, maturing very little later than the Ito San.

Black Beauty

A bean grown largely in Illinois. The Illinois Station says it is the same thing as the Ebony.

Black Eyebrow

This is an early bean that has become quite popular during the last few years. The seed is usually rather scarce and therefore commands a somewhat higher price than other early beans. Matures in 110 days.

GREENS

Medium Green

This was at one time the best known bean but is gradually being discarded as a seed producer for the reason that in unfavorable seasons it suffers more than other varieties and at all



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times shatters so badly that there is a big loss in seed. The seed is always very scarce and high in price. As a substitute we strongly recommend the Mongol described above.

Morse

Light green or olive. A heavy yielder. Matures in about 115 days, growing to a height of 30 inches. It pods very close to the ground which makes it less desirable for silage but a very good bean for hogging down and for hay.

We often have mixed Soys that we can sell at a special price.

Red Clover is sometimes sown in Soy Beans during the latter part of July. If the beans are early and are of a kind that do not shade the ground completely this seems to be a safe operation.

Soy Beans can be successfully grown by anyone and they will surely make any grower a more successful farmer.

Besides storing up nitrogen Soy Beans have a mellowing effect on the soil that puts it in fine condition for the succeeding crop. They will grow on soil too acid for clovers.

While there is little danger of sowing weeds with Soys there is some danger of planting Soys with a small percentage of germination as they are easily injured in the curing process. There is also likelihood of planting a lot of split beans.

We have the most improved machinery for cleaning them and believe we are furnishing better beans than can be purchased most places.

We give dates of maturity for Ohio. The number of days required for the ripening of beans will vary somewhat with the locality and weather conditions.

In ordering Soy Beans we shall be glad if first and second choice is given. We shall undoubtedly have several varieties not listed here.

Ask for "Soy Bean Questions and Answers."

"The soy beans I ordered from you have arrived and are of very good quality. Let me know when the supply of Haberlandts is gone, as I am referring you to quite a number of people in the state."

E. J. KINNEY,

University of Kentucky, Lexington, Ky.

"It may interest you to know that your seed has given the best satisfaction of any Soy Bean Seed that I have secured in the past three or four years. I will ask my farmers to order their seed early, and trust you will be able to fill the orders with seed of good germination."

R. V. BROWN, County Agent,

Stillwater, Minn.

"The Soy Beans arrived and are the cleanest, nicest lot I ever bought—not a cracked or mouldy bean in the lot so far as I could see. Quite different from some I have bought, one lot in particular being one-fourth mouldy and worthless for seed."

FRANK KNOWLES,

Little Hocking, Ohio.



Vetch

TWO kinds of Vetch are of agricultural importance in this country: Common Vetch (*Vicia Sativa*) and Hairy Vetch (*Vicia Villosa*). While there are both Winter and Spring strains of Common Vetch, the Spring is the only one sowed to any extent in this country except along the Pacific Coast. It is an annual.

Hairy Vetch, also known as Sand and Russian Vetch, is a Winter annual hardier than the Common. It is especially well adapted to sandy soils and will do much to build up any poor soil. It will withstand very cold weather and is without doubt the safest and best fall sowed cover crop for northern states. It is more drought resistant than most legumes and, being a great nitrogen gatherer, by all means should be inoculated.

Hairy Vetch is sown alone or with wheat or rye as a supporting crop. Where the winters are severe the nurse crop is indispensable.

Grains of Hairy Vetch are hard and require more moisture to cause germination than wheat or rye. For this reason when planted in a dry season the nurse crop sometimes makes an excellent stand while the Vetch shows only a few plants.

Many sow Hairy Vetch in July but the usual practice is to sow it during the latter part of August or up to the middle of September with rye. Ten to thirty-five pounds of Vetch is sown with three pecks to one bushel of rye. The more Hairy Vetch the more the soil will be improved.

As the price is much lower than it has been for several years it can be used in larger quantities economically.

In some parts of Michigan Hairy Vetch is sown in the spring with Marquis spring wheat for a seed crop.

Hairy Vetch grows rather slowly in the fall, but recovers quickly in the spring and makes an abundant growth to be plowed under, pastured or cut for hay.

Hairy Vetch may be seeded in the spring for pasture, either by itself or with a nurse crop, such as oats or barley. Sometimes it is mixed with Canada peas and oats as is Spring Vetch. In any case it will furnish excellent summer pasture.

Canada Field Peas

FIELD PEAS are usually spoken of as Canada Field Peas, the name having been given when the plant was comparatively unknown and the seed mainly imported from Canada. However, few varieties originated in that country.

Being a legume they are soil improvers and furnish a ration rich in protein. They can be sown for soiling and fodder and



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are unsurpassed for green manure. They are usually sown with oats, about one bushel of each, thoroughly mixed. This combination makes a very desirable hay or soiling crop, the yield being quite large.

Unlike cow peas they should be sown as early as possible in the spring, and do best farther north than Central Ohio.

One bushel of Field Peas, one bushel of Oats, four pounds of Dwarf Essex Rape and eight pounds of Sweet Clover make excellent hog pasture that can be sown in the spring, the pigs being turned in when the oats and peas are about eight inches high. The clover may be omitted.

Cow Peas

THE Cow Pea, a native of Asia, was introduced into this country over a century and a half ago, and soon came into general use in the Southern States. Here it has remained a successful crop, owing to the fact that frost seldom interferes with its growth of foliage; however, the Cow Pea has gradually found its way into northern latitudes where it has been of high value as a forage crop and a soil improver.

Timothy

THIS grass was first brought to this country from England by Timothy Hanson of Maryland in 1720.

Timothy is distinctly a grass for hay rather than pasture as it does not take kindly to trampling and close grazing. It is our hardiest and best known grass and is a part of all mixtures.

The facts concerning seeding, harvesting, etc., are so well known that it is unnecessary to enumerate them.

Although it is not difficult to procure high-grade seed, it is almost impossible to distinguish blasted and immature grains from viable seed. The careful examination and comparison of samples is therefore a matter of importance.

Often Timothy seed contains a considerable amount of sorrel owing to the fact that both grow on acid soil. It is well to be on the lookout for this as well as for Canada thistle which is not easy to identify in Timothy seed.

In Timothy seed you will nearly always find a small amount of alsike, and quite often grasshopper specks. It is not possible to entirely remove either of these, and while they hurt the looks of the seed they make no difference in the quality, and should not be confused with black plantain which is somewhat triangular and flat.



One peck is the amount usually sown per acre, or if clover is to be sown in the spring—a bushel to six acres. A satisfactory mixture is 7 pounds Timothy, 7 pounds Red and 3 pounds Alsike.

Sometimes we can supply Timothy with a streak of alsike at the same price as pure Timothy. The alsike helps the hay wonderfully.

Timothy and Alsike

THE hand-mixed Timothy and Alsike bubble has burst. The mixing of these seeds had reached such a point that the stuff sold was as rotten as anyone could desire who was looking for something cheap. The government experiment stations, and county agents finally took the matter in hand and it is to be hoped that the large distribution of this seed is at an end.

Pasture Mixtures

A MIXTURE gives a longer period for grazing, furnishes a greater variety, yields a crop richer in protein and makes a better balanced ration than would the grasses composing the mixture if sown separately. But it does not pay to sow in a mixture any grass that will not do well alone. In choosing the grasses to go into the mixture such varieties should be selected that the good qualities of one will balance points in which the other is deficient. For example, the grass that forms roots on the surface is not desirable from the standpoint of fertility; another may send its roots fairly deep but not be as suitable for pasture grass as the other. The two make a combination well adapted to grazing and maintaining the fertility. Pasture Mixture grasses should be selected with respect to their periods of growth so that grazing may be done through the longest possible period.

A small amount of various clovers should be included in the Pasture Mixture as legumes not only feed the grasses by pumping plant food from great depths to the surface, but also supply them with nitrogen drawn from the air, and, no doubt, greatly increase the protein content of the grasses. A small amount of alfalfa will do much towards getting the soil inoculated. White clover will grow where nothing else will and alsike does well in wet places. Due consideration must be given to the fact that the kind of grasses that should be used depend upon the locality. Even in a single field parts will be found that are adapted to grasses that will not thrive in the rest of the field.

Salting patches of such weeds as quack and wire grass to induce close grazing will often rid the field of these pests.

Those weeds most distasteful to cattle thrive best in meadows. Sow 20 to 25 pounds per acre.



Meadow Mixtures

MEADOW MIXTURES, in contrast with pasture mixtures, should contain only grasses that mature at about the same date.

For reasons already stated it is more profitable to sow a mixture of several grasses, including clovers, for hay rather than to sow one kind alone, for then the roots fully occupy the ground to a considerable depth, each variety getting its food from a different level, the legumes acting as feeders for the grasses.

Early Pasture and Soiling Mixture

THE Annual pasture mixtures have become popular. More energy value from the same acreage can be procured when these are made use of as soiling crops. Canada Field Peas and Oats probably take first rank. Rye and Vetch as well as Japan Millet and Dwarf Essex Rape are also used. Any of these can be added as desired to the following mixtures which we recommend:

No. 1. 8 pecks oats, 4 pecks field peas.

No. 2. 4 pecks oats, 3 pecks barley, 3 pecks rye.

No. 3. 6 pecks oats, 5 pounds sweet clover, 5 pounds alsike clover, 6 pounds timothy.

Kentucky Blue Grass (*Poa Pratensis*)

This variety of grass is native both to Europe and to North America, and, along with two or three other similar species, is the greatest American pasture grass. Authorities are of the opinion that it is grown more or less in every State in the Union. It makes the best sod of any of our grasses and does fairly well on a wide range of soils, although it is better adapted to clay than to sandy loam. It is a very nutritious pasture grass, but has little value for hay. The fact that it is both an early spring and a late fall grower makes it valuable for grazing at both ends of the season. Kentucky Blue Grass constitutes a part of practically every lawn and pasture mixture.

When sown alone, from 30 to 40 pounds per acre should be used.

Owing to the light weight of Blue Grass seed it is difficult to remove weed seeds and the germination is often quite low.

Orchard Grass (*Daactylis Glomerata*)

Orchard Grass, known as Cocksfoot in England, is a native of Europe. Its American name is due to the fact that it is successfully grown in partially shaded places.



Orchard Grass will stand more drought than Kentucky blue grass, but is not especially adapted to dry land conditions. It starts very early in the spring and grows rapidly, so that it is valuable in a pasture mixture. Orchard Grass is inclined to grow in tufts or bunches so that it will not permit an even sod. Although of high nutritive value it is not relished by stock as well as blue grass and redbtop. It thrives best on rich, well-drained loams and makes a good growth in shady places. Twenty-eight pounds is the amount usually sown per acre.

It is seldom possible to get Orchard Grass that does not contain a considerable amount of dock and sorrel and, quite often, buckhorn, all undesirable weeds.

Redtop (*Agrostis Alba*)

Redtop belongs to a class of grasses that are very widely distributed over the globe. It is a perennial which ranges in growth from a few inches to three or four feet according to the condition of soil and climate. It starts later in the spring than Kentucky Blue Grass, grows slower and matures later. Redtop is valuable for pasture and hay, but does not equal timothy. While adapted to a great variety of soils it does especially well on wet bottoms and should always be included in mixtures for such land.

About 15 pounds of clean Redtop should be sown per acre.

Miscellaneous Grasses

Besides the grasses already mentioned, we are able to offer such varieties as are in general demand: Canada Blue Grass, Meadow Fescue, Tall Meadow Oat Grass, Rye Grass, etc.

Millet

The term Millet takes in a large group of forage plants, the Foxtail being the one most widely known in this country. To the Foxtail group belong the Common, Hungarian, Golden, and Japanese varieties.

Golden Millet

This is the most largely used variety, being grown to a great extent in the West, most of the seed coming from that section.

Thirty-five to fifty pounds per acre.

Hungarian Millet

This is smaller and earlier maturing than the Golden. The hay is somewhat more desirable as it is not as coarse. Thirty-five to fifty pounds per acre.



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Dwarf Essex Rape

This valuable plant has been extensively grown in this country during recent years only.

The cost of sowing is very small as only four or five pounds per acre are required.

It grows from 1½ to 4 feet high and makes a large amount of forage for sheep, hogs or cattle.

Most of the Rape used in this country is imported. On account of the small amount of Dwarf Essex being grown at this time, other varieties are offered, many of them of little value, some contain weed seeds.

For several years it has been almost necessary to sow rape from Japan which is not as satisfactory as the English and Holland grown. We can now supply the latter.

Sudan Grass

Almost any kind of ground will grow Sudan Grass. The cost of seeding is small. It is very drought resistant. The hay is palatable and relished by stock, making a valuable, well balanced ration. It should supplant millet which affords a single cutting whereas Sudan Grass will always give two and in some sections of the South, four. After the first cutting it stools remarkably. Four tons of hay per acre is not an unusual yield. Sudan Grass is fully equal to timothy as a feed. It may be sown with a grain drill or broadcast any time after the ground becomes thoroughly warm—from corn planting time on. Five or six pounds per acre is required when sown in rows. Broadcast about twenty pounds. If sown broadcast the hay is finer. Cut when in bloom for in that stage it has the greatest feeding value. Sudan Grass is often grown with cow peas or soy beans.

"What is your price for Timothy Seed? I never had a better 'catch' than with seed obtained from you last year."

AUGUSTUS FLOYD,
Moriches, N. Y.

"The farmers in the county have had good results with Scott's Seed."

O. O. DILLON,
Graysville, O.

"Your seeds gave us good returns and we were well satisfied."

J. R. SHERRY & SON,
Grover Hill, O.

"I would like your 1921 Seed Book. I have found your seed very satisfactory and the best I have ever used."

W. W. MOORE,
Wattsburg, Pa.



Corn

IN BULLETIN NO. 414, Mr. Hartley of the Department of Agriculture says: "The nomenclature of corn varieties is in such chaos, that a varietal name is of little significance compared with the vigor, productiveness and purity of the seed. The Leaming is as constant and well recognized a variety as exists, yet seed ears purchased under this name in Connecticut or New York are, in appearance and productive ability as unlike ears of Leaming purchased in Ohio or Illinois as they are unlike ears of other varieties."

Our aim is to have each variety true to type and unmixed, but as nearly everyone has different ideas as to the ideal ear when selecting his seed corn there is naturally a great variation in the type of varieties bearing the same name.

The best insurance against loss of your labor is being certain that you plant good seed. No one ever produced a good corn crop from poor seed.

A maximum yield can be expected only when there are no weak or missing stalks. To plant a bad ear means about 900 weak, barren or missing stalks to the acre.

Cultivation, fertility of soil and drainage affect the production of corn but the crop depends first upon the selection of seed.

It is necessary to keep down such rank growing weeds as fox-tail, cockle, ragweed, etc., as well as the smaller weeds in order to save the moisture and fertility of the soil for the corn, which needs both in abundance.

Experiments have shown that in almost every case shallow cultivation is preferable to deep. In no case should corn that has reached a height of 2 or 3 feet be cultivated deeper than 4 inches. By the time the corn has reached this height the roots have spread from hill to hill. Probably 2 or 3 inches is deep enough to kill the weeds and at the same time miss the roots.

Cultivation aerates the soil and keeps it warm by preventing the evaporation of moisture.

The butt grains are fertilized first, and the pollination of the grain proceeds in regular order towards the tip. Owing to this delay in development the tip grains are thought to vary from type more often than the grains on the rest of the ear.

Experiments conducted by the Kansas Experiment Station in the field show that 90% of the middle grains produce plants while only 86% of the butt grains and 70% of the tip grains produce plants.

Thus corn should always be carefully butted and tipped by hand before grading, for no grader will entirely eliminate these



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undesirable grains. If they are not removed the planter is likely to drop the seed unevenly which will cause a smaller stand, as a uniform number of grains to the hill or space must be planted if the largest yield is expected.

Corn should ripen early enough to escape frost and late enough to make use of all favorable growing weather.

The smaller early types are now believed to be more favorable for filling the silo than the larger ensilage corns. To give best results silage must have a larger percentage of nutritive value than is found in the immature sappy fodder of southern sorts. The ears should be ripe enough to be well dented and not too soft.

In describing the different types we have tried to give the exact number of days in which they will mature, as we see no reason for listing a 110-day corn at 85 or 90 or even 100 days. Growing conditions, however, affect the maturity of corn several days either way so it is impossible to tell the exact number of days.

Guaranty

It is manifestly impossible to guarantee corn to grow and make a crop—too many things can happen after it has been planted—but we guarantee our corn to show a high percentage of strong germination in any test that you care to make.

Keep the shipment just as long as you please. If there is anything that you do not like about the corn send it back and we will return your money, paying all transportation charges of course.

Little Clarage

This corn has become very popular. Many of the men who have grown it claim that it will ripen in 85 days, but we have found that enthusiastic growers of early corn are usually about ten days off in their estimates of ripening time.

Ears average from $7\frac{1}{2}$ to 8 inches long and the corn never fails to ripen. The cob is small and the production of shelled corn will be about equal to that of many of the larger eared kinds. For an extra early corn we know of none that will surpass it.

Leaming

This is a yellow dent corn, about nine inches long, with a medium large cob. It matures in about 110 days. Besides being a large yielder, it is valuable for either forage or ensilage, being used quite extensively in the East for the latter purpose.

Little Cob Yellow Dent

This is an early corn with a very small cob. The ears average 9 inches in length. Although a yellow corn every cob is white. The grower who began raising it forty years ago thought he liked



white cobs better than red. It is a carefully selected, high-bred corn and as we sometimes find a single ear of Flint in a field we suppose there was a mixture of Flint in the original selection. This may account for its very small cob and the fact that it matures early and thoroughly.

For a quick-ripening, all-around corn we know of none that will give better satisfaction. Three years ago it was the only corn around here that showed a germination of 90%. We recommend it for early ensilage as the stalk contains more leaves than other varieties. If you are not entirely satisfied with the corn you are growing, we suggest that you give this variety a trial. It matures in about 110 days. We have about discontinued selling late varieties. The percentage of failures is too great. We believe there is no variety that will surpass it as a general all-round corn.

110-Day White (Commonly called 100-Day White)

Of this corn we cannot speak too highly. The ears average $8\frac{1}{2}$ to 9 inches in length. We could probably best describe it by calling it a white Clarage. The grains are inclined to be broad and they are never chaffy, but hard and firm and of great feeding value. Altogether, it makes the most solid corn of any variety we have ever seen.

It does equally well on either clay or black land. It is especially adapted for hogging-down or for husking from the stalk, because back of this corn are years of selection with the aim of making the ear waist high and the fodder small. In favorable seasons it will mature in less than 110 days, being earlier than most of the so-called 100-Day or Early White corns and superior to them. Those who like a white corn will find that this will meet every requirement.

White Cap

We have a very satisfactory type of this variety. It matures in from 115 to 120 days. It is a large yielder and a favorite with many growers.

U. S. Selection No. 133

Selection 133 has been bred from Minnesota 13 and is very early.

Ensilage Corn

In ensilage corn we can supply the Virginia or Blue Ridge type. This is one of the best ensilage corns. It makes a large growth of thick succulent fodder.



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Wheat

IT IS a very common thing to see Wheat fields full of mustard, cockle, dock and other weeds. If you could see what we clean out of Wheat you would not wonder at this; but the surprising thing is that anyone will sow Wheat which has not been thoroughly cleaned. By using a little extra care in buying seed, the yield can be increased several bushels per acre.

Our Wheat is just as carefully selected and cleaned as are our clover and grass seeds. We believe it will more than pay for itself by adding to the crop. It contains nothing but large plump berries. The varieties listed below, which have proved the most desirable, are in stock. We are often able to furnish other varieties also.

Wheat should be sown two bushels to the acre as it has been shown through many tests that where this amount is used more profit is realized than where six, seven or nine pecks are sown. There is absolutely nothing in the claim that a peck or half-bushel of certain varieties is enough for an acre.

Poole

This is one of the old standbys. It is beardless, a heavy yielder and stands the winter well.

Portage

This was developed by the Ohio Experiment Station and is a pure line selection from the Poole. It is a good milling Wheat and in stiffness of straw ranks a little below the Poole. It has a smooth head, red chaff and red kernel.

Gladden

This is a pure line selection of Gypsy, developed by the Ohio Experiment Station. It has a very stiff straw, is a large yielder, and as a milling Wheat is above the average. It is bearded, with a white smooth chaff and red kernel.

We find that the demand for Gladden is increasing each year not only in Ohio but in other states.

Nigger

One of the best known bearded varieties which produces an extra hard grain, almost equal to Spring Wheat in this respect.

Spring Wheat

Spring Wheat has become quite popular during the last three years although it did not turn out as well as usual this year on account of the hot weather. In Ohio it should be planted as near the middle of March as possible.



O. M. Scott & Sons Co.

Oats

IN THE United States, Oats are second in importance to Wheat and Corn only. There are many different strains and varieties. We have found those listed below to give excellent satisfaction.

Sixty-Day

Not only is this the earliest Oats, but one of the largest yielders. Owing to its extreme earliness it will make a crop where later varieties will fail. The straw is short and does not lodge, which makes it particularly desirable for a nurse crop. It has great feed value for the reason that the hull is thin and light. One of the best varieties for a soiling crop used in connection with field peas.

Siberian

A well-known popular variety and a large yielder. We have Ohio No. 210. An improvement on the original in yield and stiffness of straw.

Scottish Chief

We sold this variety in 1916 for the first time, having brought in a carload from Montana.

We have been selling the Oats raised from this original carload ever since. All reports indicate that the Scottish Chief will out-yield other varieties. They are a trifle earlier than the average Oats and have a stiffer and shorter straw. We cannot recommend this variety too highly.

Oats are usually sown two bushels to the acre.

Rosen Rye

This pedigreed variety was originated by the Michigan Experiment Station. The berry is larger and plumper than other Rye, the heads long and broad. Another great advantage is the stiffer straw, enabling it to stand up better in heavy wind and rain storms. It showed an average yield of 40 bushels per acre at the Experiment Farm, and will always exceed the yield of ordinary Rye by from 5 to 15 bushels per acre. Sow about one and one-half bushels per acre.



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Barley

ONE-EIGHTH of the entire production of Barley is raised in Wisconsin where special efforts have been made to increase the yield by establishing pedigreed varieties. These efforts have borne fruit in the development of a more desirable strain.

Experiments have shown that the Wisconsin Pedigreed Barley outyielded the ordinary Barley by 5 bushels per acre.

We have an extra fine quality of this Barley which we have very carefully recleaned.

We remove all small and blasted grains as well as all weed seeds.

Two bushels are sown per acre.

Beardless Barley

All Beardless Barley is more or less mixed with the bearded so we cannot guarantee our seed to be pure. However, we have a rather limited amount of Barley that is much more free from Bearded than the average run and will be found entirely satisfactory either as a nurse or grain crop.

In addition to the grains described here we can furnish Sorghum, Kaffir Corn, Buckwheat, Cow Horn Turnips, etc.

Lawn and Golf Course Seed

Ask for Booklet "Weedless Lawns"

WE GUARANTEE our lawn seed to grow. Owing to its freedom from weeds and dead grains it should go at least 25% farther than other mixtures. We have lawn seed for both ordinary and shady places.

We shall not attempt to go into an extended discussion of lawns and lawn seed here. The matter is too important to crowd into a small space. In our booklet "Weedless Lawns" we believe we have handled the question of making and maintaining lawns a little more carefully than is usually done.

This booklet describes and illustrates the weeds usually found in lawns and tells how to get rid of them, how to keep from sowing them, and how to judge lawn seed, besides giving instructions for the sowing, mowing, watering and general care of the lawn. It applies as well to the maintenance of golf courses.

We will gladly send the booklet on request.

We have a special trial offer on Lawn Seed of three pounds for one dollar, postage paid.



O. M. Scott & Sons Co.

Legume Bacteria

Ask for Bacteria "Questions and Answers"

NITROGEN, which is essential to the growth of all plants and animals, is constantly being removed from the soil. Some of the instrumentalities of its removal are: the growth of grain and other crops, the drainage of land, and the action of wind and rain. A portion of this loss may be made up by the manure produced on the farm and by commercial nitrogen, but the cost of the latter is too great for profitable use. The only way in which nitrogen can be supplied so that farming may be profitably conducted is to draw upon the unlimited supply in the air.

Only the legumes, clover, beans, peas, etc., are capable of utilizing the nitrogen of the atmosphere. They are rich in protein, requiring more nitrogen than other plants; being heavy nitrogen feeders would be against them if they could not take the nitrogen from the air and use it. The air is made up of several gases, the proportion of nitrogen being 79%.

A legume cannot of itself make use of this nitrogen but the bacteria which live within the nodules on the roots are able directly to utilize the nitrogen of the air. The nitrogen passes into the bacteria and is changed along with other substances that are present into more complex nitrogenous substances which are used in some unknown way by the legume. The legume gives the bacteria a favorable place for development. It supplies the bacteria with sugars and other substances they need and in return the bacteria make the nitrogen of the air available for use of the plant.

The bacteria penetrate the root hairs and rapidly reproduce themselves. After a time the bacteria reach the interior of the root, still reproducing, and pass from one cell to another. The root enlarges and the nodule is formed. A plant cannot take nitrogen from the air unless the proper strain of bacteria is already in the soil or is introduced by inoculation.

To show that inoculation pays and performs a real service for the farmer legumes have often been grown experimentally in sterilized soil that is entirely lacking in nitrogen. In these tests the inoculated plants make vigorous growth in spite of the absence of plant food in the soil.

Besides storing up nitrogen for the use of following crops, inoculation in most cases increases the growth of the inoculated legume, besides, making this legume richer in protein. Even though the yield is not increased the plant is without doubt storing up nitrogen for crops that will follow instead of robbing the soil for its own use.



Field Seeds Less Weeds.

"Friendly Workers of the Soil"

The subject of soil bacteriology and its relation to practical farming is interesting and important. There is too much to be said on this subject to do it justice in a few short paragraphs, so we have prepared a booklet entitled "Friendly Workers of the Soil." You will not find it tedious reading and the information it contains should prove helpful to every farmer.

The problem of keeping the soil as productive as possible is vital. If the ground is kept in a healthy condition you avoid half the gamble of farming. Inoculation is a big factor in increasing yields and in enhancing the value of your farm by building up the soil. The scientific way as compared with the soil method is not only more thorough but more economical.

Scott's Guaranteed Bacteria

The greatest advantages of Scott's Bacteria may be enumerated briefly: ease of application, economy, and guaranteed results. These three factors are worthy of the closest consideration in buying inoculating material. It has been difficult in the past to secure cultures that measured up in all three respects.

When you are ready to plant a legume of any kind, send for enough of Scott's Bacteria to inoculate. One can is sufficient for thirty pounds of clover, or sixty pounds of peas or beans. The price of one dollar per can, postage paid, makes the cost per acre very small. Yet the investment probably pays greater returns than anything that can be done on the farm.

In ordering please specify the kind of legume you want to inoculate. The following groups are each inoculated by different strains of bacteria: Alfalfa, Sweet and Burr Clovers; all true clovers, Red, Alsike, Mammoth, Crimson, and White; Cowpeas, Jap Clover, Lima and Velvet Beans; Soybeans; Garden and Field Beans; Garden and Field Peas, and Vetches.

If you have not received "Friendly Workers of the Soil," or, having looked it over, wish additional copies, let us hear from you.

"We should like heartily to thank you for and congratulate you upon printing 'Friendly Workers of the Soil,' which is in many ways a highly creditable and useful epitome of technically accurate information on an important subject. We think so much of the books of this type which you have been publishing in recent years that we keep them on file for reference purposes."

THE BREEDERS' GAZETTE,
Chicago, Ill.

"I read with the deepest interest your booklet on 'Friendly Workers of the Soil.' It is wonderfully clear cut and easily understood."

HAL B. FULLERTON,
Director of Agriculture, Long Island Railroad Co.



A Few Points About Ordering

Order Early. It always pays. Prices may be no higher, but sometimes it is impossible to get pure seed late in the season.

Order Blank. Use it please. When shipping point is different from your mail address give county under each name. There is space on the back for a few names.

Prepay Stations. If yours is a prepay station be sure to so state on the order blank and send plenty of money for freight charges. We return the difference.

Freight or Express. We always ship by freight unless otherwise specified. However, one should keep in mind that express companies give low rates on seed. A small order can sometimes be sent as cheaply by express as by freight. On moderately sized orders we advise express. Marysville is in Union County, Ohio, thirty miles from Columbus on the C. C. C. & St. L. and T. & O. C. Railways. Beans, Peas, and Grains take fourth class freight rates, seeds third class rates.

Parcel Post. Seed may be sent by parcel post according to the following table. In the first, second and third zone the weight limit is 70 pounds; in the others the weight limit is 50 pounds. Where it is as convenient express shipments are better, for many parcel post shipments are lost and it is especially difficult to collect when a shipment is damaged and partially lost.

Zone Rates		1st lb. or	Additional lb.
Zone		fraction	or fraction
1st within 50 miles of Marysville	5c		1c
2nd within 50 to 150 miles of Marysville	5c		1c
3rd within 150 to 300 miles of Marysville	6c		2c
4th within 300 to 600 miles of Marysville	7c		4c
5th within 600 to 1,000 miles of Marysville	8c		6c
6th within 1,000 to 1,400 miles of Marysville ...	9c		8c
7th within 1,400 to 1,800 miles of Marysville ...	11c		10c
8th within 1,800 and over miles of Marysville	12c		12c

Bags. It is not possible to ship three bushels of seed in one bag. It would be better if no bag contained over two bushels of clover seed, it is less likely to be carelessly handled by railroad employes and torn. The express company allows us to ship not over 100 pounds in a bag. We furnish bags at practically cost or less, so you get full value. We prefer to ship in new bags but if you wish send your own bags, being sure to put your name and address on the package and do not neglect to notify us by letter, otherwise they may be overlooked. Please do not put order in package with bags. Send good unpatched cotton bags. Burlaps are not suitable for seed and usually cause losses on grain shipments.



Field Seeds Less Weeds.

Change in Price

All seed must be sold on the basis of market quotations. It is for this reason that our prices are for prompt acceptance. It is not possible to keep you constantly informed of market changes. A slight fluctuation, however, does not affect our prices. We always accept orders at the prices quoted if at all possible, but we must follow any material changes whether they be up or down.

We lose more orders when prices decline after our quotations have gone out than when prices advance. For instance, with Timothy last Fall, for a few days after our prices were mailed, orders were received in large volume. Within a week the market went off \$1.50 per bushel, and the orders stopped coming. Doubtless our customers had received the lower quotation from other sources and ordered, though our price then was also \$1.50 lower.

If you delay ordering after our price list has reached you some instructions for a possible adjustment should be sent. The simplest method is by adding or deducting seed. We often do the former or refund by check, but we never deduct seed unless so instructed. Taking the time to write causes a delay but we must be sure that the extra cost is approved by our customer. To send invoice for a balance due is impossible. By the use of this method in years past our ledgers were completely swamped with small charges. Both time and expense were required to collect them.

Please remember that anything which detracts from efficiency is an expense and that eventually the buyer must pay it. We therefore ask your co-operation in enabling us to handle orders as economically and as promptly as possible. If you wish to do so, just send along for the seed you require without writing for later quotations. Give us instructions to be followed in case of a change in price and we will guarantee that our treatment of the order will meet entirely with your approval.

"I have looked over your little booklet of ten lessons on 'Friendly Workers of the Soil' and find it very interesting reading, which the farmer certainly can grasp and profit therefrom."

C. O. CROMER,

Associate in Crops, Purdue University, Lafayette, Ind.

"Your bacteria surely did make nodules both on Beans and Sweet Clover. I put Soy Beans on a poor, sandy hillside and they are three feet high now and still green."

R. G. STRIGHT,

New Marshfield, Ohio, R. No. 1.



Cash with Order

In every case we must ask Cash with Order.

Cash is logical; credit is not. Credit means that a part of our shipments each year will remain unpaid for, and that some collections will be made at considerable expense.

Before we changed to a cash basis several years ago we used to receive settlements of small accounts, especially, with apologies like these:

"Please pardon our delay in sending check."

"We had entirely overlooked this account."

"I am mortified that this bill was not paid before."

"We were of the opinion that this bill had been paid."

"Please pardon our carelessness."

They are simply typical of many cases. Obviously cash is the best plan. We must adhere to it in every transaction.

Small Lots. It is necessary to make an extra charge for very small lots but we appreciate receiving these orders just as much as the large ones.

"Your seeds proved quite satisfactory and I can recommend them to anyone who contemplates buying."

DESS SIMMERMAN,
Punxsutawney, Pa.

"Your seed is the cleanest and best I have bought from any seedsman. I advise every farmer who buys seed to use Scott's."

H. S. LIVELY,
Long Branch, W. Va.

"In my mind your seed was the best ever used in this county."

C. A. JACKSON,
Lewisburg, W. Va.



Field Seeds Less Weeds.

Freight and Express Rates from Marysville, Ohio

	Freight Class		Ex. per 100 lbs.		Freight Class		Ex. per 100 lbs.
	3rd	4th			3rd	4th	
Arkansas				New York—Con.			
Little Rock	\$2.16	\$1.77	\$3.06	Delhi	\$0.78	\$0.53	\$2.03
Connecticut				Elmira . . . . .	.67	.47	1.82
Hartford . . . . .	.89	.63	2.39	New York . . . . .	.84	.59	2.23
Delaware				Rochester . . . . .	.63	.47	1.82
Wilmington . . . . .	.78	.53	2.13	Syracuse . . . . .	.67	.47	1.92
Dist. of Col.				North Carolina			
Washington . . . . .	.80	.55	2.03	Raleigh	1.42	1.05	2.86
Georgia				Ohio			
Atlanta	1.86	1.52	2.75	Cambridge . . . . .	.39	.30	1.09
Illinois				Celina . . . . .	.37	.28	.94
Chicago . . . . .	.61	.46	1.46	Cincinnati . . . . .	.44	.33	1.09
Danville . . . . .	.58	.44	1.35	Circleville . . . . .	.35	.27	.94
Springfield . . . . .	.66	.50	1.71	Cleveland . . . . .	.46	.35	1.09
Indiana				Mansfield . . . . .	.37	.28	.94
Auburn . . . . .	.53	.40	1.19	Pomeroy . . . . .	.48	.36	1.09
Evansville . . . . .	.58	.44	1.71	Portsmouth . . . . .	.49	.37	1.46
Indianapolis . . . . .	.51	.39	1.35	Toledo . . . . .	.42	.32	.94
South Bend . . . . .	.59	.44	1.35	Zanesville . . . . .	.39	.30	1.19
Iowa				Pennsylvania			
Des Moines	1.37	1.07	2.50	Clearfield . . . . .	.80	.55	1.67
Kentucky				Meadville . . . . .	.78	.53	1.35
Hickman . . . . .	.79	.69	2.08	Philadelphia . . . . .	.78	.53	2.13
Lexington . . . . .	.83	.70	1.35	Pittsburgh . . . . .	.56	.42	1.46
Williamsburg . . . . .	.78	.53	1.97	Wellsboro . . . . .	.80	.55	1.82
Maine				Wilkesbarre . . . . .	.78	.53	2.03
Portland . . . . .	.89	.63	2.54	Rhode Island			
Maryland				Providence . . . . .	.89	.63	2.50
Baltimore . . . . .	.80	.55	2.03	Tennessee			
Massachusetts				Knoxville . . . . .	.98	.77	2.39
Boston . . . . .	.89	.63	2.39	Vermont			
Michigan				Montpelier . . . . .	.80	.55	2.39
Detroit . . . . .	.50	.37	1.19	Virginia			
Grand Rapids . . . . .	.58	.44	1.35	Hampton . . . . .	.81	.56	2.50
Jackson . . . . .	.51	.39	1.19	Charlottesville . . . . .	.81	.56	2.03
Ludington . . . . .	.77	.58	1.82	Richmond . . . . .	.81	.56	2.39
Minnesota				West Virginia			
Minneapolis	1.19	.86	2.65	Charleston . . . . .	.55	.41	1.61
St. Paul	1.19	.86	2.86	Clarksburg . . . . .	.60	.44	1.46
Missouri				Harrisville . . . . .	.60	.44	1.19
Jefferson City	1.18	.90	2.44	Huntington . . . . .	.49	.37	1.46
New Hampshire				Morgantown . . . . .	.60	.44	1.61
Concord . . . . .	.89	.63	2.54	Wheeling . . . . .	.56	.43	1.19
New York				Wisconsin			
Albany . . . . .	.81	.57	2.13	Madison . . . . .	.67	.51	1.92
Buffalo . . . . .	.63	.47	1.71	Milwaukee . . . . .	.67	.51	1.82
Canton . . . . .	.89	.63	2.13				



Legal Weight and Quantity per Acre

KIND OF SEED	Pounds sown per acre	Weight per bu.
Timothy	10 to 15	45 lbs.
Alfalfa (broadcast)	10 to 15	60 lbs.
Alsike	5 to 8	60 lbs.
Red Clover	10 to 15	60 lbs.
Crimson Clover	10 to 14	60 lbs.
Sweet Clover (hulled)	12 to 15	60 lbs.
Sweet Clover (unhulled)	15 to 20	30 lbs.
Redtop Fancy (solid seed)	14 to 20	14 lbs.
Blue Grass	30 to 35	14 lbs.
Orchard Grass	25 to 30	14 lbs.
Meadow Fescue	20 to 24	24 lbs.
Tall Oat Grass	20 to 30	14 lbs.
Lawn Grass Seed.....	60 to 80	
Canada Field Peas (with oats)	90 to 100	60 lbs.
Cow Peas (broadcast)	90 to 120	60 lbs.
Cow Peas (drilled)	50 to 60	60 lbs.
Soy Beans (broadcast)	60 to 75	60 lbs.
Soy Beans (drilled)	30 to 40	60 lbs.
Hairy Vetch (with rye)	10 to 50	
Dwarf Essex Rape	4 to 7	50 lbs.
Golden Millet	40 to 50	50 lbs.
Hungarian Millet	40 to 50	50 lbs.
Japanese Millet	15 to 20	32 lbs.
Sorghum	70 to 90	50 lbs.
Buckwheat	60 to 75	50 lbs.
Oats	75 to 90	32 lbs.
Barley	90 to 110	48 lbs.
Wheat	90 to 110	60 lbs.
Field Corn	8 to 10	56 lbs.
Rye	75 to 85	56 lbs.





